The Use and Value of Financial Advice for Retirement Planning

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Abstract

Offering professional advice around the retirement planning process represents an important component of the financial services industry. We examine the demographic, investment, and behavioral characteristics of individuals who obtain this advice as well as the economic value that it ultimately adds. Using a survey of more than 4,000 working households, we find that wealth and income levels are positively correlated with the decision to engage a professional advisor, as are such factors as marital status, age, and education level. To assess the value added by this advice, we develop a unique metric of retirement income replacement which incorporates health-based life expectancy and household-specific financial circumstances. The approach estimates the percentage of annual pre-retirement income that a household will be able to spend each year in retirement. We establish the unconditional finding that advised households generate significantly larger proportions of post-employment spending (both gross and net of Social Security benefits) than do non-advised households. Controlling for additional explanatory factors, we find that an advisor adds more than 15 percentage points of income replacement in retirement. These findings support the conclusion that obtaining and implementing financial advice in the retirement planning process leads to a demonstrable increase in the level of sustainable retirement spending.

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1. Introduction

Of all the investment problems that individuals are likely to face in their lifetimes, planning for the expenditures needed to fund a successful retirement is perhaps the most acute. Even in a world where financial information is relatively plentiful and all investors are equally well-endowed with the skills to process that information, individuals still face significant challenges in managing the capital market risks they will face, to say nothing of the uncertainty of their own lifespans. Of course, beyond those market and mortality risks, acquiring and processing the information necessary to make optimal planning decisions are often costly endeavors. Not surprisingly, then, investors frequently turn to professional advisors to help guide them through any of several aspects of the retirement planning process.

Without question, the portion of the financial services industry devoted to providing investment advice is significant. Foerster, Linnainmaa, Melzer, and Previtero (2017) note that roughly half of the households in both the United States and Canada use investment professionals to assist them with various asset management tasks. Further, the overall breadth of the registered investment advisor community suggests it plays an important role in helping investors manage their financial affairs. While the exact size of this market segment is not clear, a 2015 report by the Investment Adviser Association and National Regulatory Services places the number of SEC-registered investment advisors at 11,473, whereas the research firm of Cerulli Associates places the number of financial advisors closer to 285,000.[1] Regardless of the precise numbers, advisors clearly play a role in managing and assisting in the placement of a substantial amount of private investment capital.

Beyond attempting to explain the size of this industry segment, the more important questions to ask are which individuals are most likely to seek professional counsel and, for those who do, whether these advisors add to the investors' financial security, wealth, and well-being. Further, if registered advisors do add any demonstrable value through their services, in what form does this value manifest itself: enhanced wealth accumulation, superior portfolio formation

[1] The IAA-NRS also lists the level of regulatory assets under management for this industry segment at $66 trillion, which double counts certain assets, such as fund-of-funds, because the advisor overseeing the pool reports its value as do each individual fund's advisor. The report, however, ignores the large number of state-registered investment advisors firms in existence.

practices, or improved investment discipline? Or, perhaps clients who contract with a financial advisor are more confident and make better investment decisions for themselves. Finally, does any such value added, however measured, exceed the cost of the advice?

Addressing the two main questions at hand—who uses advice from the financial services industry and how can the value added by that counsel be quantified—are topics that have been of considerable interest to researchers and practitioners alike. Past studies concerned with determining the likely users of advisory services often focus on the individual's perceived financial literacy, with the presumed link being that the least literate investors would benefit the most from receiving advice, as in Inderst and Ottaviani (2012a). Lusardi and Mitchell (2014) survey the considerable literature around this topic and document that financial literacy varies widely with age, gender, nationality, and education levels, with high literacy levels occurring in middle age, non-U.S. residents, male, and better educated respondents.[2] Stolper and Walter (2017) consider the issue of whether financial advice does serve as an effective substitute for low literacy but conclude that the evidence is mixed, at least partly due to moral hazard issues in the advisor-advisee relationship, a point underscored by the "advisor audit" findings of Mullainathan, Noeth, and Schoar (2012).[3] In fact, Collins (2012) argues that professional counsel is actually a *complement* to literacy in that individuals with higher incomes, higher educational achievements, and greater pre-existing financial competencies are more likely to seek financial advice in the first place. The empirical evidence in Bhattacharya et al. (2012) supports this view; in their study of 8,000 retail brokerage clients, the users of financial advice tended to be older, more financially sophisticated, and had greater accumulated wealth; Finke (2013) documents that household wealth is the strongest indicator of the decision to engage a financial planner.

The academic literature is also replete with studies that assess the ultimate impact of obtaining and implementing financial advice. One immediate challenge in this effort is to define the specific measure by which an increase in value can be determined. Perhaps the most direct

[2] Hung and Yoong (2013) investigate the demographic characteristics that serve as determinants for financial advisor usage in a sample of more than 2,200 defined contribution plan participants. Their findings indicate that marital status was the only statistically reliable predictor of the propensity to seek advice from a set of variables that also included gender, age, annual income, education, and heredity. Additionally, Kim, Maurer, and Mitchell (2019) report experimental evidence supporting the finding that more cognitively able people age 50+ tend to seek financial advice of a higher quality, but not of a greater quantity.

[3] Bucher-Koenen and Koenen (2015) model the advisor-investor relationship and show that more financially sophisticated (i.e., male, better educated) individuals are likely to receive more and better counsel from advisors. However, their empirical evidence also indicates that when low literate individuals do seek expert advice, they are more likely to actually implement that advice; for more on this point, see also Calcagno and Monticone (2015).

metric along these lines is an incremental increase in the terminal value (e.g., at the date of retirement) of the invested asset portfolio—either nominally or on a risk-adjusted basis—that results from adopting suggested economic or lifestyle adjustments. Alternatively, the value of the advice might obtain from the design of the investment strategy itself, such as the formation of a better diversified portfolio with less idiosyncratic risk. Finally, implementing the advice of a financial services professional could alter an individual's behavior in a number of meaningful ways, such as through an increased savings discipline or a commitment to a more formal planning and budgeting process.

Regardless of how the benefit is measured, there is no straightforward consensus as to whether financial advice produces value for the investor in excess of the costs. Some studies document that financial advisors do induce positive outcomes, either through enhanced accumulated asset levels (Cockerline (2015)) or through improved savings behavior, which in turn leads to significant terminal wealth differentials relative to otherwise comparable non-advised investors (Montmarquette and Viennot-Briot (2015)). Also, Kramer (2012) and Von Gaudecker (2015) both document that advised investors hold measurably better diversified portfolios than do otherwise comparable non-advised investors. Bhattacharya et al. (2012) show that portfolio efficiency (i.e., Sharpe ratio) does improve for those investors who both obtain *and* follow the advice, while Finke (2013) indicates that investors who consult with a financial planner make more informed choices in the retirement planning process. On the other hand, Hackethal, Haliassos, and Jappelli (2012) find that advised brokerage accounts generate, on average, lower net returns and inferior risk-return tradeoffs compared to self-managed accounts, in part because of the higher fees associated with the former. Similarly, Bergstresser, Chalmers, and Tufano (2009) document that broker-sold mutual funds deliver lower risk-adjusted returns than direct-sold funds, even before netting out distribution costs. Karabulut (2013) demonstrates for a sample of more than 3,000 individuals that bank-advised investors make more mistakes in their asset allocation decisions (i.e., relative to benchmark asset class weights) than do self-directed investors. Lastly, Foerster, Linnainmaa, Melzer, and Previtero (2017) as well as Linnainmaa, Melzer, and Previtero (2017) show that advised portfolios often reflect the asset allocation or trading preferences of the advisor, which may be inconsistent with the investment objectives and constraints of the client.[4]

[4] In an interesting related experimental study, Agnew et al. (2016) stress the inherent agency conflicts in the advisor-advisee relationship and establish that those advisors who confirm the investor's prior beliefs are most likely

In this study, we address both of the main questions posed above from the perspective of managing retirement portfolios. First, using data generated by an extensive and unique survey of working households, we examine the economic and behavioral characteristics of those participants who either did or did not employ the services of a financial counselor in the process of planning for their retirements. We then take a new approach to answering the second question regarding the value of financial advice by focusing on whether the retirement outlook of the advised households is improved as a result of the counsel. Specifically, in lieu of looking at adjustments to standard wealth measures, we focus instead on the investor's *income replacement* level in retirement. As we explain, this metric has the advantage of including in the analysis not only accumulated wealth but also the stream of the investor's future savings. Moreover, it includes his or her Social Security benefits, the relative amount of which might influence the decision to seek financial advice in the first place.

We start by describing the nature of a recent survey of more than 4,000 households drawn from across the United States and employed in a wide cross-section of different industries and professions. The survey assessed myriad aspects of the current financial circumstances and attitudes of these households, as well as the extent of their retirement planning. In particular, the survey polled respondents as to whether or not they were currently using a financial advisor or had used one in the recent past. A number of salient characteristics differentiated the advised subgroup, which constituted 23 percent of the overall sample, from the non-advised subgroup. Most noticeably, the advised group was generally wealthier at the time of the survey, with significantly larger levels of annual income, annual savings, and accumulated wealth in their existing asset portfolios. Further, the advised households were, on average, older, more likely to be married, had achieved a higher education level than non-advised households, and were more confident in their economic decision-making skills. However, there appeared to be little difference in the health status (indicated by the presence or absence of a number of adverse conditions such as diabetes, high blood pressure, or cardiovascular disease) between the two subgroups.

To address the issue of whether receiving this financial advice actually matters, we extend the *retirement present value* methodology introduced in Harlow and Brown (2016, 2017) to

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to be selected, regardless of the quality of the advice. Also, Inderst and Ottaviani (2012b) provide a theoretical framework for an advisor compensation structure that addresses these agency issues. Finally, Egan, Matvos, and Seru (2017) document a non-trivial degree of misconduct (e.g., regulatory and criminal offenses, customer disputes) that exists in the market for financial advice, acts which are clearly inconsistent with the well-being of the client.

develop an income replacement statistic as the ratio of the household's post-retirement annual spending level to its real income level at the time of retirement. The premise of our analysis is that using professional advice is a value-adding endeavor if it meaningfully increases income replacement in retirement, after controlling for other explanatory influences. Generally, our findings provide overwhelming support the conclusion that this is indeed what happens. On an unconditional basis (i.e., not adjusted for additional controls), the retirement income replacement statistic—which, for the overall sample, is 82.4 percent—increases to 104.8 percent for advised households but falls to 75.7 percent for the non-advised subgroup. This differential between advised and non-advised outcomes becomes even more significant when the income replacement statistic is adjusted by removing Social Security benefits in order to focus on just the portion of the household's retirement portfolio that the advice is most likely to influence.

An important caveat is the effect that other investor characteristics beyond receiving financial advice might have on the retirement income replacement outcome; in fact, these additional explanatory factors represent potential sources of endogeneity that need to be considered. Based on the survey data, the main control variables we account for in calculating an adjusted value-added measure for the financial advice usage variable are household accumulated assets, household annual income, respondent age, marital status, higher education level, health status, and access to a workplace savings plan. We document that when various combinations of these control variables are included in the analysis, the net increase in a household's retirement income replacement ratio that is directly attributable to using a financial advisor ranges from 14.6 to 17.5 percentage points, all of which are statistically significant. The net impact of the financial advice usage variable when the entire set of additional controls is used in the estimation is 15.1 percent, which is the amount by which a household implementing the advice of a professional counselor can expect to see its post-retirement spending level increase, all else held equal.

We also conduct a number of extensions and robustness checks of our primary analysis. In particular, since the survey data does not allow for a direct "before and after" look at the actual changes to investor behavior induced by receiving financial advice, we compare outcomes for advised households with a matching set of non-advised households that had made similar choices with respect to the most relevant investment decision variables (e.g., savings level, asset allocation, financial planning). Taking these factors into account, advised households still produce retirement income replacement ratios that are between 9.0 and 12.7 percentage points

higher than otherwise comparable non-advised investors. Second, as an alternative method of controlling for endogeneity biases, we develop an instrumental variable to estimate the probability that a household will use a financial advisor, given its underlying financial and behavioral characteristics. Replacing the actual indicator for advice use with this instrument in our empirical estimation had no material impact on the finding that obtaining advice is significantly and positively correlated with improved retirement outcomes. Third, we considered how that financial advice might have manifested itself in the form of an enhanced level of retirement spending. Whether the actual advisor use indicator or the estimated use probability instrument was used, households that employed professional counsel had measurably different pre-retirement investment tendencies, such as a greater commitment to savings, larger equity allocations, more likely to develop a formal financial plan, and greater use of target date and target risk funds. Finally, extensive sensitivity analysis on the underlying determinants of income replacement in retirement and the advisor use decision confirmed the substantial impact that household wealth, respondent education level, and pre-retirement income have on those outcomes.

We conclude that households that obtain and implement financial advice in planning their post-employment economic activities are able to generate a significantly greater proportion of sustainable retirement spending than do non-advised households. Consequently, our findings strongly support the supposition that financial advice does in fact add positive value to the retirements of those who choose to use it.

2. Description of the Retirement Survey

2.1 Survey Structure and Process

Brightwork Partners LLC, a research-based consulting firm focused on the financial services industry, conducted a detailed survey of more than 4,000 working Americans, aged 25 to 65 years, on their beliefs, activities, and behaviors toward retirement savings. The survey instrument, which was distributed in January 2015, consisted of 81 multi-part questions designed to establish a complete financial picture of the each respondent's current household circumstances, as well as a considerable amount of additional demographic and attitudinal data. A representative subset of questions from the survey instrument is shown in the Appendix.

The initial data solicited in the survey involved the background of the members of the household, including gender, age, employment status, ethnicity, state of residence, and marital

status. Respondents were then queried about the nature and amount of the household's asset base. Specifically, they were asked to provide information on the assets currently or previously held in defined contribution savings plans, defined benefit plans, as well as additional savings vehicles such as individual retirement accounts and security brokerage accounts. Data on other financial assets was also gathered and included such items as the cash value of life insurance, annuities, inheritance, the amount of home equity, and the proceeds from the sale of a small business that could eventually be used to fund retirement.

In addition to the amount of accumulated wealth, survey questions also sought to quantify the amount of savings going into different household accounts as well as the amount of any employer fund-matching within each workplace savings account. Additional detail around the structure of their investments was obtained, such as asset allocation patterns (e.g., equity, fixed-income, cash equivalents) and the use of target-date or target-risk funds. Beyond questions regarding savings behavior, respondents were also asked to provide details on the sources and levels of all streams of current income generated by any member of the household.

In the present context, a crucial aspect of the survey was the information it generated as to whether and when households used paid advisors to assist them in making financial decisions, financial product selection, or in selecting providers of other financial services. The survey defined a financial advisor as someone who the respondent paid either through direct fees or indirectly through investment product commissions. The survey also sought to establish whether that relationship with the paid financial advisor was current and on-going or whether it had taken place within the past five years. Respondents were also asked if their advisor was connected to their current workplace retirement plan. However, the survey did not indicate the specific adjustments that participants might have made to their retirement planning process as a result of receiving financial counsel.

The survey also included attitudinal questions around a variety of topics. Generally, these questions fell into two categories: retirement objectives and investor confidence. First, respondents were asked to identify their main savings objective as well as whether their primary investment goal for retirement involved minimizing portfolio risk, maximizing income, or maximizing the level of bequest to heirs. Second, the survey also elicited opinions as to how confident respondents were in their judgments regarding several aspects of the retirement planning process, such as the sustainable income level they will eventually need, whether they

can depend on Social Security payments, and whether their investment strategy for retirement is sufficient for their purposes.

Finally, Harlow and Brown (2017) demonstrate that the income required to fund a sustainable retirement plan varies dramatically with the state of an investor's health, primarily because of the impact that certain health conditions (e.g., cancer, diabetes) have on mortality.[5] Accordingly, each survey respondent was also asked if they had one or more the following health conditions: diabetes, cancer, high blood pressure, high cholesterol, cardiovascular disease, tobacco user. The same information was solicited of all members of the household, including the respondent's spouse or significant other partner.

2.2 Initial Survey Results: Overall Sample and Demographic Trends

Table 1 reports arithmetic average values for several of the critical variables gathered in the Brightwork Partners survey, including the level of accumulated assets and income in the household, whether the household has used a paid financial advisor, various demographic factors concerning the respondent (e.g., age, marital status, education level), the health status of the household, and whether the respondent is eligible to participate in a workplace defined contribution plan. In addition to listing these statistics for the overall sample of 4,004 households, the display breaks them out by the industry of the respondent's primary employment and the geographic region and specific state in which the household is located. (The final column of the display reports the mean level of the household's retirement income replacement ratio, which will be described in detail in the next section.)

Starting with the findings for the overall sample, the age of the average respondent was 42.7 years, which would place him or her somewhere between two to three decades away from a traditional point of retirement. The accumulated assets available for retirement and current total annual income level of the average household were $397,500 and $116,000, respectively. About three in five respondents had attained some education beyond high school and almost two-thirds (i.e., 63.9 percent) were currently married. Most importantly for our purposes, 23.0 percent of the households (i.e., 919 of 4,004) had used a paid financial advisor in some aspect of their retirement financial planning process during the past five years. Finally, slightly more than half

[5] In particular, Harlow and Brown (2017) show that, in order to fund retirement spending for the rest of their lives, investors with adverse health conditions will typically need to accumulate an asset portfolio worth only 65 to 80 percent (depending on gender) of what a healthy individual would require. This highlights the importance of integrating the individual's mortality risk into the development of our measure of the value added from using a financial advisor, which is discussed below.

of the households had access to a defined contribution plan through their employer and just 39.0 percent of the households reported that all members were free from each of the adverse health conditions.

Table 1 also indicates that there is a considerable amount of cross-sectional variation in these outcomes when viewed by either occupation or location. In particular, the average accumulated wealth varied dramatically by industry of employment, with a maximum of $547,700 in natural resources and a minimum of $230,200 in the other services category. Household assets also differed substantially by state, with California ($591,600) and Pennsylvania ($237,800) representing the high and low ends of the geographical spectrum. Beyond that, it is apparent that the use of a financial advisor also differs by region (e.g., 30.3 percent of Illinois residents used a paid advisor while only 13.9 percent of North Carolina households did so) and, with less variation, by source of employment as well. Interestingly, the same two industries representing the high and low accumulated asset levels—natural resources and other services—also represented the most frequent and least frequent use of paid financial advice.

3. Estimating Income Replacement in Retirement: Methodology

3.1 Notion of Retirement Income Replacement

As discussed earlier, past research provides myriad ways to measure the potential value added to investors from employing a financial advisor, including increased terminal wealth values, better diversified portfolios, better asset allocation alignments, or mitigated behavioral biases. An objective of this study is to introduce a new value-added metric by determining if and how a paid financial advisor influences an investor's *retirement income replacement* (RIR) ratio. We define RIR as the proportion of household h's pre-retirement working income that is replaced by annual post-retirement spending from all sources:

$$\mathrm{RIR_h} = \frac{\mathrm{RS_h}}{\mathrm{WR_h}} = \frac{[(\text{Spending from Household Retirement Portfolio})+(\text{Social Security Benefits})]_{\mathrm{h}}}{(\text{Real Income Level at Retirement Age})_{\mathrm{h}}} \qquad (1)$$

where $\mathrm{RS_h}$ is the constant real spending amount in retirement for the h-th household and $\mathrm{WR_h}$ is the real wage level of that household immediately prior to the point of retirement.

The interpretation of (1) is as follows: RIR represents the percentage of a household's inflation-adjusted income level at the time of retirement that can be sustained on annual basis

throughout retirement. Clearly, the higher this proportion is, the more successful the household's retirement is judged to be. The notion of (1) as a measure of income replacement owes to the fact that the pre-retirement income stream (WR) for a household is likely to include labor income as a major component whereas spending in retirement (RS) will need to be funded with the proceeds generated by a variety of retirement investment vehicles. Aside from Social Security benefits, the sustainable income associated with these retirement portfolios will, to a great extent, be a function of the household's investment prowess. So, we have a straightforward interpretation of (1) as a value-added measure: if using a professional advisor results in a demonstrably higher RIR level relative to that experienced by an otherwise comparable non-advised household, that financial advice—whether due, for example, to the adoption of a superior asset allocation strategy or the implementation of a prudent financial plan—has provided a bona fide service.

An important consideration with the RIR statistic is that it cannot be observed directly, but must be estimated for any given household. In fact, inasmuch as the average respondent in the survey summarized in Table 1 is only about 43 years old, both variables in the retirement income replacement ratio (i.e., RS and WR) need to be approximated. Of the two components, this is more easily accomplished for WR, which we estimate by inflating the actual reported income level for each member of a household by 1.0 percent per year from their current age at the time of the survey until they would reach retirement.[6] Without loss of generality, we assume that retirement occurs for all household members at the age of 65 years. To establish RS, we need to determine the amount of constant real spending in retirement that is sustainable given the uncertainty around both investment returns and the life expectancies of the members of the household. This process is explained below in more detail.

3.2 Estimating the RS Component of RIR: Methodology

In their analysis of optimal asset allocation schemes in retirement, Harlow and Brown (2016) demonstrate the retirement present value (RPV) method, which views a retirement plan as consisting of both current and future assets and liabilities. A distinct advantage of the RPV approach is that it allows for both stochastic capital market effects and health state-specific mortality effects for household members in forecasting future spending needs. Specifically, the

[6] This approximation for the annual growth rate of real wages is based on Bureau of Labor Statistics data, which indicates that wage inflation has averaged 1.0 percent over and above CPI-W since 1951.

method treats savings contributions as both assets and flows into the retirement portfolio, which fluctuate in value over time with variable investment returns, while retirement expenses are represented as both current and future liabilities and treated as outflows from the portfolio.

Calculating the RPV measure is a straightforward application of the process of discounting a series of probability-weighted future cash flows, which can be modeled as:

$$\text{RPV} = \sum_{t=0}^{\infty} \frac{p_t CF_t}{(1+ R_t)^t} \qquad (2)$$

where:

p_t = probability of being alive at date t,

CF_t = cash flow at date t,

R_t = the risk-adjusted discount rate date t.

The set of retirement plan cash flows, $\{CF_t\}$ in (2), represent savings inflows into the portfolio prior to retirement age and the outflows from living expenses (i.e., retirement spending needs) deducted after retirement at, say, date T. CF_0 in the RPV analysis represents the individual's current savings portfolio at any specified date t = 0. The probability of being alive at future date t, p_t, is obtained from mortality tables based on health conditions provided by the survey respondents.[7]

The discount rate R_t prevailing at each future date t needed to calculate (2) is based on the returns to the household's retirement investment portfolio available in each year leading up to that date. Forecasts of these annual returns, denoted r_t, can be expressed:

$$(1 + R_t)^t = (1 + r_1)(1 + r_2)(1 + r_3) \dots (1 + r_t) = \prod_{m=1}^{t} (1 + r_m) \qquad (3)$$

where:

$$r_t = \sum_{A=1}^{N} (w_{At}) \text{ x } (r_{At}) . \qquad (4)$$

In (4), $\{w_A\}$ are the set of allocation weights to the N asset classes representing the investable universe for the household's retirement portfolio and $\{r_A\}$ are the set of asset class returns. Of

[7] In Harlow and Brown (2016), mortality effects are modeled for representative male and female investors using the life expectancy tables produced by the U.S. Social Security Administration. Harlow and Brown (2017) use both gender- and health state-specific mortality probabilities that were obtained from HealthView Services Inc., a commercial provider of actuarial data to the insurance and medical professions.

course, the values for $\{r_A\}$ as of any given future date will be unknown at date 0 and must be projected with either historical time series or through Monte Carlo simulation.

Within the context of this analytical structure, the numerator of the retirement income replacement statistic in (1)—that is, RS—can be seen as the largest possible single value of $\{CF_t\}$ that spans the period from when retirement commences at date T through the remainder of the household member's life. That is, RS represents the maximum sustainable spending level that is consistent with the income expected to be generated by the sources of retirement savings (including Social Security benefits) as well as the mortality profile of the investor. To compute this measure, Harlow and Brown (2016) show that the RPV model requires a representation of retirement risk to frame the optimization process. To be consistent with the most common approach used in the literature (e.g., Milevsky and Robinson (2005), Stout (2008), and Rook (2014)), we represent this risk here as the probability of ruin, which can be expressed as a zero-order, lower-partial moment (LPM) of the distribution of RPV outcomes about a target value of zero as follows:

$$\mathrm{LPM}_0 = \sum_{\mathrm{RPV_j}<\tau}(\tau - \mathrm{RPV_j})^0/(\mathrm{n}-1) \qquad (5)$$

where RPV_j = the j-th RPV outcome from the set of n observations from (2), (3), and (4), as generated from return simulations and with a pre-determined target value of τ.[8] The estimated sustainable retirement spending (RS) level can then be obtained by maximizing the value of CF_t in (2) during the household's post-retirement years under the restriction that the probability of ruin remains at or below a tolerable fixed percentage.

3.3 Estimating RIR: Overall Sample Results

To establish household-specific estimates of the RS_h and WR_h statistics needed to compute RIR_h in (1), we made a number of assumptions regarding the estimation process. As noted earlier, the real income level at retirement (WR) is established by compounding all sources of the current level of household income at the time of the survey by 1.0 percent until the age of 65 years. To estimate the constant real spending amount in retirement (RS), we begin with the assumption that the investable universe for all investors can be represented by three asset classes: equity, fixed income, and cash equivalents. The asset class investment weights, {w}, were obtained for a

[8] Other popular ways of expressing the downside risk inherent in this investment problem would include *expected shortfall* and *semi-deviation*, which can be viewed as the first- and second-order lower partial moment functions, respectively. See Bawa (1975), Bawa and Lindenburg (1977), Harlow and Rao (1989), and Harlow (1991).

given household from specific questions in the survey that is summarized in the Appendix. For simplicity, we assume that a household's savings are invested with a constant asset mix throughout retirement. Further, we assume that stock, bonds, and cash have real returns of 6.0, 3.0, and 1.0 percent, respectively, as well as having respective volatilities of 16.0, 7.0, and 2.5 percent.[9] Using these capital market distributional parameters, we employ a Monte Carlo simulation to produce 10,000 sequences of potential portfolio returns (r_{At}), which were then used to construct the discount rates embedded in the RPV formula in (2). Finally, we set the probability of ruin threshold at 10.0 percent and specified $\tau = 0.0$ percent.

With this methodological approach, RS can be estimated for any particular household with a health state-specific mortality risk projection of $\{p_t\}$ by optimizing the annual level of retirement spending that would be consistent with a probability of ruin constraint remaining at or below 10.0 percent. That is, RS is determined such that the resulting number of simulated RPV values that fall below zero does not exceed 10.0 percent of total. So, with 10,000 Monte Carlo simulations being run, no more than 1,000 of these would have negative RPVs, indicating an unsustainable level of retirement spending. Once estimated in this fashion for each household, RS_h can simply be divided by WR_h to obtain the retirement income replacement (RIR_h) statistic.[10]

The final column of Table 1 reports mean values of RIR for the overall sample of 4,004 surveyed households, as well as for the occupational and geographical subsets described earlier. The main outcome is that, for the entire sample, the average household has a sustainable retirement income replacement level of 82.4 percent. This suggests that the typical household will have the financial resources in retirement to support an annual level of spending that is about 20 percent less that it was capable of with its pre-retirement income. While this result is consistent with data from the U.S. Government Accountability Office (2016) that investors typically replace 75.0-80.0 percent of their pre-retirement income, it nevertheless implies a potential lifestyle adjustment for the average household. Further, there appears to be a

[9] We also assume that real stock returns have a correlation with those of bonds and cash of 0.20 and 0.15, respectively, and that the correlation of real bond returns with real cash returns is 0.35. These assumptions, as well as the expected returns and volatilities, are generally consistent with historical trends in the United States capital markets since 1946.

[10] To simplify the subsequent analysis, we present findings based only on these base case assumptions. However, we have replicated our results for a wide range of alternative specifications on the capital market assumptions, asset allocation parameters, and risk metrics. Generally speaking, none of these supplementary data alter our main conclusions regarding the differential impact of whether an investor employs a financial advisor and what the value added is for those households that do seek financial advice. As such, we suppress their presentation here but they remain available upon request.

reasonable degree of heterogeneity in the RIR measure across both professions and regions. Other services professionals can only expect to sustain an average of 73.9 percent of their previous income once they retire whereas people employed in the construction industry can expect to replace virtually their entire income (i.e., 97.4 percent) in retirement. On the other hand, several states have low mean RIR levels (e.g., Pennsylvania, Virginia, North Carolina, Ohio) while other states produce higher-than-average retirement income replacement levels (e.g., California, Illinois, Georgia). In subsequent sections, we will explore the determinants for the differences in these outcomes.

4. The Use of Financial Advice

Before turning to the matter of whether using financial advice produces a measurable increase in a household's retirement income replacement ratio, it is worth addressing the issue of who chooses to employ a professional advisor in the first place. That is, what are the characteristics that separate advised and non-advised households? Table 2 provides a more detailed breakdown of the Brightwork Partners survey data, focusing on the difference between those households that either were or were not advised on various aspects of their retirement planning process. Listed in the display are either median or mean values for several of the survey variables most relevant to the present context, broken down for the overall sample, the non-advised group, and the advised group. For convenience, the characteristic variables are grouped according to the survey categories shown in the Appendix (e.g., "Retirement Objectives" variables include Minimizing Risk, Maximizing Income, or Maximizing Bequest). To facilitate the comparison, the last two columns of the table show the difference between the advised and non-advised groups for a given variable, as well as the statistical significance level of that difference.

There are a number of financial and behavioral characteristics separating households that either did or did not use a professional advisor over the previous five years. It appears that the advised group made a substantially greater commitment to accumulating wealth, with mean annual savings differential of $15,725 (= $29,463 - $13,738); the median value of this incremental savings was $13,375. Also, the average advised household had a significantly higher allocation to equities in their retirement portfolio than did non-advised respondents (47.9 vs. 36.1 percent) and made greater use of target date and target risk funds. The advised group was far more likely to have a formal financial plan in place (44.0 vs. 10.9 percent) and were significantly more confident about all aspects for the retirement planning process (e.g., 13.1

percent higher confidence level in their asset allocation decision). Advised households also recognized saving for retirement as an explicit financial goal to a greater degree (80.8 vs. 64.9 percent), were less interested in retiring debt as a goal (33.5 vs. 43.8 percent), and were more committed to saving for future healthcare expenses (31.1 vs. 21.0 percent) and seeking to build the value of their estates (19.0 vs. 10.6 percent).

While the data in Table 2 reflect a number of important characteristic differences between advised and non-advised survey respondents, some of these variables may reflect the *effect* of receiving advice rather than a determinant of why a household might have sought professional advice to begin with. To focus on that concern, Table 3 reports the findings of a series of logistic regressions in which the dependent variable is an indicator variable of whether a household did (= 1) or did not (= 0) employ a financial advisor to help with retirement planning. The prospective determinants of this decision include characteristics that more precisely define the personal or financial background of the respondents, such as accumulated household wealth, household income, age, marital status, educational level, health status, and whether they are eligible to participate in workplace defined contribution plan. Separate regression models were estimated for each potential determinant as well as for various combinations of these variables.

The results indicate the presence of a number of significant relationships between respondent characteristics and the decision to engage a professional advisor. As in Bhattacharya et al. (2012) and Finke (2013), wealthier households—measured either by accumulated asset holdings or current income levels—were significantly more likely to solicit financial advice in planning their retirements. Likewise, older respondents, married households, and better educated households all fell into the advised group with greater frequency, consistent with the findings of Hung and Yoong (2013) and Lusardi and Mitchell (2014). These effects were robust to whether the respective variables were modeled separately or combined into a single equation. Conversely, there appeared to be no connection between the financial advice decision and household health status (i.e., whether all members were free from the various adverse health conditions surveyed) or whether a workplace defined contribution plan was available. In summary, it does appear that reliable indicators exist for answering the question of who is likely to use financial advice in retirement planning endeavors and that these characteristics support the

conclusion in Collins (2012) that advisor engagement is positively correlated with the markers for higher financial literacy.[11]

5. Retirement Income Replacement and the Value of Financial Advice

5.1 Financial Advice and Retirement Income Replacement: Initial Findings

While the previous findings underscore the material behavioral and characteristic differences between households that either do or do not seek financial advice, they do not address the issue of whether that advice is valuable. Table 4 provides initial evidence regarding the relationship between the decision to engage a professional advisor and the impact that decision might have on the household's retirement plan. This exhibit once again compares the average values of various survey data and outcomes for both the advised and non-advised subgroups in the overall sample. The statistic of primary interest is once again the retirement income replacement ratio (RIR), which is listed here both inclusive of Social Security benefits (i.e., as shown in (1) and calculated with the RPV model in (2) – (5)) or net of those entitlement payments (i.e., the same RIR computation for which Social Security payments have been subtracted from the optimized RS value for each household).[12]

Table 4 lists both median and mean values for the two forms of the RIR statistic. Beginning with the total measure (i.e., RIR including Social Security), it is clear that the overall cross-sectional distribution is highly skewed inasmuch as the median (63.0 percent) and mean (82.4 percent) values differ so widely. Indeed, the household falling at the 50th-percentile of the distribution can only expect to spend about two-thirds of their previous income level once they reach retirement, which falls well below the frequently recommended guideline replacement level of 80.0 percent. More important, however, is the difference that exists in the retirement income replacement levels between the advised and non-advised groups. Whether viewed on a median basis (81.2 vs. 58.8 percent) or a mean basis (104.8 vs. 75.7 percent), these differences

[11] In fact, there is no evidence in either Table 2 or Table 3 to support the view framed in Stolper and Walter (2017) that engaging a retirement advisor can serve as an effective substitute for those households with the low financial literacy levels. All of the statistically significant determinants shown in these displays (e.g., higher wealth levels, married households, better educated households) are indicative of higher levels of financial literacy. Of course, it is possible for a household to be relatively financially competent and still need help in planning for retirement, which is where the services of the registered advisor comes into play.

[12] Jappelli and Padula (2013) model an individual's decision to invest in financial literacy over time as a means of increasing household assets and they demonstrate that the presence of a Social Security system reduces the investor's incentive to accumulate assets and incur costs to become more financial literate. Consequently, we assume that the relative size of Social Security benefits in the numerator of the RIR statistic may also affect the ultimate value that a financial advisor can produce for a client.

are both large and highly statistically significant. Indeed, the mean household that has received financial advice can expect to generate post-retirement spending that is almost 105 percent of its pre-retirement income level, which is more than 29 percentage points greater than the income replacement experienced by non-advised households. Accordingly, these median and mean RIR differentials are highly suggestive that using financial advice in the planning process can positively and materially impact a household's post-retirement outcome.

Figure 1, which displays the entire distributions of estimated total RIR values for the advised and non-advised subgroups, provides visual confirmation of this supposition. Panel A shows the frequency with which each RIR level occurs in the respective populations while Panel B illustrates the cumulative probability of a subgroup achieving a given RIR ratio. The frequency histograms for each subgroup are in fact highly skewed, with the advised distribution containing considerably more observations at each RIR level above the overall sample mean of 82.4 percent. Beyond that, the median advised household (indicated by the intersection with the horizontal dotted line in Panel B) has a retirement income replacement ratio that is virtually the same as this sample mean, whereas the median non-advised RIR statistic has been shown to be less than 60 percent. This differential between the two groups continues to widen at successively higher RIR levels.

In principle, financial advice can impact any aspect of a household's RS measure, which in turn affects the RIR statistic in a commensurate manner. Practically, though, it is most likely that an advisor can have the greatest impact on the management of household's retirement portfolio that is separate from their Social Security entitlement payments. Thus, the second line in both the median and mean blocks of Table 4 reports for both the non-advised and advised subsamples the average RIR values that have those benefits netted out. The immediate effect of this adjustment is that the income replacement level drops considerably; for the overall sample, the average value falls from 82.4 to 48.5 percent. This decline indicates the extent to which the average household remains dependent on the Social Security system to sustain its retirement. Beyond that, it is also apparent that the differential in net RIR values between advised and non-advised households is actually wider than for the total RIR levels (e.g., the median differential for net RIR and total RIR are 28.7 and 22.4 percent, respectively). Further, the mean net RIR value for advised households (75.2 percent) is close the overall sample mean for total RIR. It is reasonable then to conclude that the use of financial advice becomes even more valuable the

greater the percentage that the managed retirement portfolio contributes to the provision of sustainable retirement spending.

While it is clear that the average advised household in this sample produced a substantially higher RIR outcome than the average non-advised household, it is not altogether clear why that benefit occurred. Asked differently, by what channel did the acquisition of professional advice benefit the investor in the retirement planning process? Although the survey instrument summarized in the Appendix was not explicit in detailing the exact nature of the services rendered by advisors, the data presented thus far does suggest several possible ways in which such advice was beneficial. For instance, from Table 2 we know that advised households are considerably more likely to develop a formal financial plan; creating and adhering to a document of this nature may help to align investment objectives and prevent behavioral mistakes, in the spirit of the mental accounting portfolio optimization developed in Das, Markowitz, Scheid, and Statman (2010). Also, advised households follow markedly different asset allocation strategies, with larger commitments to equity investments and greater use of sophisticated allocation vehicles, such as target date and target risk funds.[13] Finally, the advised group is significantly more confident in both the process and the anticipated outcome of their investment activity, which is likely a consequence of having received superior education about the process. Thus, by whatever channel it manifests, incorporating professional advice into planning for retirement appears to be a value-adding proposition.

5.2 Advice and its Effect on Retirement Income Replacement: Regression Analysis

The findings in Table 4 support a positive conclusion regarding the value of using a financial advisor. However, two issues merit further consideration. First, by design, the comparison of the median and mean outcomes from the advised and non-advised groups assess only two points of those cross-sectional distributions. Second, there are possible endogeneity concerns when viewing in isolation the impact that the decision to use a financial advisor has on RIR. We have seen, for instance, that better educated households with more assets also produce significantly higher RIR scores. So, could it be that prior education and wealth are responsible for producing both larger income replacement levels as well as the decision to seek professional advice?

[13] The result that advised households make greater use of target date and target risk funds is an interesting contrast to Chalmers and Reuter (2015), who argue that target date funds (TDF) serve as substitutes for broker recommendations in retirement portfolio management and that the use of TDFs can reduce investor-broker agency conflicts.

As a first attempt to address both of these empirical issues, Table 5 presents the results of a series of cross-sectional regression models using the complete sample of 4,004 surveyed households and the adjusted version of the RIR ratio in (1) as the dependent variable. Based on the previous findings regarding the portion of replacement spending potentially impacted by financial planning, we use the form of the RIR statistic that nets out Social Security benefits. The primary determinant appearing on the right-hand side of each of these equations is the indicator variable of whether households either did (= 1) or did not (= 0) use a professional financial advisor in their retirement planning. The models then differ by which of several additional control variables are involved, including total household assets, current household income, age of respondent, marital status of household, higher education level of respondent, household health status, or whether the household is eligible for a defined contribution plan. Different regressions are estimated with the Use of Advisor variable and (i) each of the control variables separately, or (ii) various combinations of the control variables, including all of them at once.[14]

By construction, a positive value for the estimated coefficient of the Use of Advisor variable indicates that the income placement ratio is larger for advised households than for non-advised ones. All 14 versions of the cross-sectional regression equation reported in Table 5 indicate that estimated coefficient on this variable are indeed positive and statistically significant at the 0.001 level. To interpret the reported values of these coefficients, consider the parameters for Model 1, which simply regresses the net RIR statistic against the advised indicator variable. The estimated intercept (0.4049) and variable (0.3471) parameters correspond directly to the values reported in Table 4 for the mean non-advised RIR without Social Security ratio (40.5 percent) and the difference in that ratio between the advised and non-advised households (34.7 percent). Therefore, the regression coefficient on the Use of Advisor variable in Table 5 can be interpreted as the incremental change in retirement income replacement that occurs when a household moves from not using a financial professional in retirement planning to engaging the services of an advisor.

[14] Oster (2017) has examined the conditions under which a regression-based model can provide sufficient omitted variable controls in analyzing the effect that the main treatment variable (e.g., Use of Advisor) has on the outcome variable (e.g., Income Replacement). The essence of her "R_{max}" evaluation approach is to assess the stability of the estimated parameter on the treatment variable while also gauging the extent to which the overall R-squared coefficient is enhanced as additional controls are added to the regression equation. $R_{max} = 1$ indicates that the outcome can be fully explained by the treatment and control variables.

This is a useful interpretation when assessing how the impact of financial advice is affected by including the various control variables. Some of these control variables, such as respondent age, higher education level, and household health status, make little difference in that the estimated Use of Advisor coefficient changes relatively little (e.g., 0.3254 when Higher Education is used in Model 6). For other controls, the parameter reduction is more pronounced; for example, when the Household Assets variable is added in Model 2, the Use of Advisor coefficient shrinks to 0.1100. Further, when various combinations of the control variables are used (Models 9-14), the advised parameter ranges from 0.1463 to 0.1749. The estimated value associated with the full specification in Model 14 indicates that, after accounting for all other influences, the use of a financial advisor can be expected to increase a household's net retirement income replacement ratio by more than 15 percentage points (i.e., 0.1513). This remains a statistically significant adjustment directly attributable to the decision to seek professional retirement planning advice. As such, it provides more persuasive evidence that this engagement is a value-adding activity for the investor.[15]

5.3 Advice and Retirement Income Replacement: Nearest-Neighbor Sample Matching

In an ideal experiment, households would be randomly assigned to either a treatment group (e.g., receive financial advice on retirement planning) or a non-treatment group. This random assignment would insure that the distributions of other confounding factors (e.g., household income, education level, accumulated savings) are similar in the two groups and that any difference in outcome (i.e., retirement income replacement level) is a direct effect of the treatment. However, these conditions are seldom likely to hold in any observational study where the treatment and control groups are themselves formed on the basis of survey data. While the regression-based method just described offers one approach to mitigating the influence of confounding variables across the two partitions of the sample, Austin (2011) argues for a different tactic to allow an observational (i.e., non-randomized) study to mimic the salient characteristics of a randomized experimental design. Specifically, he documents the benefits of

[15] Note that each of the multifactor Models 9-14 in Table 5 were estimated including fixed effect controls for a household's (i) industry of employment, (ii) region of primary residence, and (iii) state of primary residence, based on the cross-sectional differences for these variables established in Table 1. The inclusion of these controls did not meaningfully alter any of the findings; in particular, the incremental impact that advisor usage has on the income replacement ratio exceeds 15 percentage points either with or without these fixed effects. The analysis of Foerster, Linnainmaa, Melzer, and Previtero (2017) suggests that another control that might be useful to include would be advisor fixed effects. However, that is not possible with the Brightwork Partners survey data since household-specific advisor identities were not revealed.

the *propensity score* method of Rosenbaum and Rubin (1983), whereby each household in the treatment (i.e., advised) group is matched with the specific non-treatment (i.e., non-advised) household that comes the closest to mirroring the nature of its control variable exposures.

As a second approach to regulate the influence of confounding factors, we adopt the propensity score methodology to create an alternative control group by finding the nearest non-advised neighbor match for each of the households in the advised group. The control variables used to calculate the propensity scores were same ones designated as additional explanatory factors in our regression analysis: Household Assets, Household Income, Age, Marital Status, Higher Education, Household Health Status, and Eligibility for a DC plan. The analysis then uses these controls to fit a logistic regression model and compute propensity scores for all 3,085 non-advised households, with the response being the probability of assignment to the advised group. For each advised household, the nearest-neighbor non-advised match is identified as the household that minimizes the distance between the respective propensity scores. This pairing process is typically done without replacement, meaning that each advised household will have a unique matching non-advised neighbor.[16]

Table 6 compares the average levels of several variables for both the advised and non-advised neighbor groups, as well as the statistical significance of the differences in those average levels. Panel A lists the findings for the seven propensity score control variables used in the nearest neighbor matching process. The most important thing to note is that none of the differences in average values between the two groups is statistically reliable for any of the potential confounding factors (e.g., the respective average annual income levels for the advised and non-advised neighbor households are $139,480 and 142,018, which leads to an insignificant difference of -$2,538). Consequently, these data support the conclusion that the nearest neighbor matching procedure has produced an alternative control group sample that better approximates the distributional characteristics of the advised group on many critical dimensions.

Panel B of Table 6 lists similar group average values and differences for a variety of outcome variables that can be regarded as a direct consequence of receiving financial advice. In

[16] When creating a nearest-neighbor matching sample without replacement, the order in which the advised households are selected can affect the ultimate set of outcomes. For this reason, we tried a variety of different matching procedures (e.g., different selection orders, different propensity scoring systems), all of which generated substantially similar results. Also, it is possible to restrict the matching process with distance constraints on the advised and non-advised propensity scores, with advised households whose nearest match exceeds the propensity score distance limit being removed from the sample as a means of reducing the influence of extreme outliers. In the nearest-neighbor matching results shown below, these distance restrictions reduced the 919 households in the unrestricted advised group to a final sample of 866 matched pairs.

the present context, the most critical of these outcomes is the change in retirement income replacement level, as measured either without or with Social Security benefits. Other outcomes that might result from employing financial counsel include such things as changes in household savings (expressed in dollars or as a percentage of income), adjustments to asset allocation strategies, or the development of a financial plan. As indicated in the third and fourth columns of Panel B, the mean RIR value for the advised group once again exceeds the comparable statistic for the non-advised neighbor sample by more than 15 percentage points, regardless of whether Social Security benefits are netted out or included in the calculation (i.e., differences in means of 0.1574 and 0.1583, respectively). These findings are strikingly similar to the advisor impact result from the regression-based control variable analysis in Table 5, which also exceeded 15 percentage points. This is useful confirmation that an assessment of the value of using a financial advisor in the retirement planning process is not materially affected by the manner in which potential confounding influences are included in the analysis. Beyond this primary result, the data in Table 6 also demonstrate that advised households have significantly higher saving levels, are more likely to have adopted a written financial plan, have higher equity commitments in their asset allocations, and are more likely to own longevity insurance (i.e., annuities). As discussed earlier, all of these ancillary outcomes are likely to be contributing factors as to why a significant retirement income replacement differential exists for advised households in the first place.[17]

5.4 Assessing the Components of Financial Advice: A Closer Look

A challenge in using the Brightwork Partners survey data is that it is not possible to know the exact reason why working with a financial advisor results in a significant increase a household's measured RIR outcome. That is, while the preceding analysis indicates that advised investors tend to save more, adopt enhanced equity holdings, and use formal written financial plans to a greater extent, it is not clear which of those adjustments matters the most. Fortunately, the propensity score matching process just described provides a natural way for making this assessment.

[17] It is interesting to compare the average advised group income replacement findings in Table 6 to those for the unrestricted sample in Panel A of Table 4. Whether or not Social Security benefits are included, the mean RIR levels are smaller for the nearest-neighbor matched sample in Table 6 (e.g., 0.6738 vs. 0.7570 for net RIR). This suggests that the propensity score distance restrictions imposed in the neighbor-matched analysis had the effect of truncating the most extreme positive RIR outcomes from advised group, which provides additional evidence that the benefit of receiving financial advice is not being driven by some of the extreme outliers in the advised sample.

Specifically, for each advised household, we can reconfigure the process for selecting the nearest non-advised household match to include these outcome variables as control factors in the propensity score methodology. So, in addition to the original seven "base case" controls (i.e., Household Assets, Household Income, Age, Marital Status, Higher Education, Household Health Status, and Eligibility for a DC plan) used in the matching methodology, we add a series of variables representing the outcome of having been advised. The resulting difference in mean RIR levels between the advised and non-advised matching samples can then be compared to the base case differential shown in Table 6 to establish the incremental impact of adding a particular outcome variable to the initial set of matching controls. Constructed in this way, each augmented non-advised matching sample will produce a nice intuitive interpretation: if non-advised households happen to arrive on their own at the same investment decision as do advisor-led households—say, both have the same stock allocation or the similar savings levels—is there any remaining advantage to receiving financial advice?

Table 7 reproduces this RIR differential analysis for five different non-advised nearest-neighbor matching samples formed by supplementing the seven base case controls with the following investment outcome variables, added independently: (i) Household Saving ($), (ii) Equity Allocation, (iii) Has Written Plan, (iv) Uses Target Date Fund, and (v) the combination of Household Saving, Equity Allocation, and Has Written Plan. For comparative convenience, Panel A reproduces the advised vs. non-advised RIR differentials using the base case analysis reported earlier (i.e., 15.7 percent and 15.8 percent when RIR is measured without and with Social Security transfers, respectively). The third and fourth columns in the various segments of Panel B then show comparable RIR differential values using the amended non-advised matching samples. For instance, when non-advised neighbors are chosen to also have similar levels of household savings as advised investors, the advised households still produce mean RIR statistics more than 10.0 percentage points higher (i.e., 0.1043 and 0.1049, respectively, in Panel B.1). So, the benefit for the average non-advised household adopting the same savings level as an otherwise comparable advised household is an RIR increase of 5.3 percentage points (e.g., 0.0531 = 0.1574 - 0.1043 for net RIR); this can be viewed as the incremental benefit of the savings decision, regardless of how that decision was achieved.

Panels B.2 and B.3 document the effect of adding two of the other main investment decision variables—equity allocation and committing to a written financial plan—in the nearest-neighbor matching process. In the former case, the marginal impact of a non-advised household

increasing its equity allocation to the same level as the typical advised investor is 3.0 percentage points (e.g., 0.0300 = 0.1574 - 0.1274 for net RIR). Importantly, though, even when they have similar stock holdings, advised households continue to maintain an income replacement advantage over non-advised households in excess of 12.7 percentage points, meaning that the ultimate value of receiving retirement advice goes well beyond adjustments to the asset allocation scheme alone. The findings for the written plan variable are even more pronounced: when a non-advised household adopts a formal written plan, it closes the RIR gap by almost 7.0 percentage points (i.e., 0.0682 for net RIR, 0.0688 for total RIR), although the overall RIR advantage for advised households remains almost 9.0 percentage points (e.g., a net RIR differential of 0.0892).[18]

Finally, as indicated in Panel B.5, even when all three investment variables (Household Savings, Equity Allocation, Has Written Plan) are added to the non-advised neighbor matching method at the same time, there is still a statistically significant difference in mean retirement income replacement levels for advised and non-advised households: advised household outperform by 11.1 and 11.4 percentage points, respectively, for RIR without and with Social Security benefits. Thus, even after controlling for the influence of the most likely specific recommendations that a financial advisor might make, advised households continue to enjoy an appreciable advantage in the level of the income they are projected to receive in retirement.

6. Predicted Financial Advisor Usage: Extensions and Robustness Analysis

6.1 Estimating the Likelihood of Using a Financial Advisor

The findings reported in the preceding section strongly support the notion that using a financial advisor in retirement planning is a beneficial decision. However, it bears repeating that measuring the impact unique to that choice is challenging due to its relationship with several other control factors, most notably the size of the household's asset portfolio. So, if wealthier households are more likely to use an advisor and then become even wealthier after obtaining that advice, how should the benefit of the decision be determined? Beyond the two methods just

[18] We have also produced analysis for alternative non-advised matching samples including the remaining investment decision variables: Use of Target Date Fund, Use of Target Risk Fund, and Owns Longevity Insurance. Panel B.4 of Table 7 reports findings for the Target Date Fund variable, with the others being suppressed for the sake of brevity. In all three cases, however, there is the somewhat curious result that the addition of the extra nearest-neighbor matching variable leads to an expansion of the RIR differential statistic relative to the base case (e.g., 0.1740 vs. 0.1574 for net RIR in Panel B.4), meaning that the value of receiving *other* financial advice is even greater than it was before deploying these particular investment tools.

considered (i.e., regression-based controls and propensity score-based sample matching) to address this endogeneity issue, Montmarquette and Viennot-Briot (2015) suggest a third approach using instrumental variables. Specifically, they employ a binary regression model to estimate the probability of using a financial advisor based on a number of explanatory variables capturing the relevant information about members of the household. This advisor use probability instrument can then be deployed in lieu of the standard indicator variable as the primary determinant in an equation explaining the potential value added by the financial advisor.

We implement this methodology by using our earlier logistic regression analysis in Table 3 to assess the likelihood that the 4,004 households in the Brightwork Partners survey would use an advisor. Specifically, for each household in the sample, we convert the binary categorical variable (i.e., 1 if advised, 0 if non-advised) into a probability estimate using parameters calculated for Model 9, which includes as independent variables household assets, household income, respondent age, marital status and higher education level.[19] This Estimated Probability of Advisor instrument replaces the Use of Advisor indicator as the main determinant in a regression attempting to explain a household's post-retirement income replacement level.

As an illustration of this conversion process, Figure 2 shows how the estimated advisor use probability variable relates to three of its primary determinants: household assets, marital status, and higher education level. Specifically, the financial advice instrument is plotted against total assets (expressed in logarithmic form) for two sizeable subgroups of the overall sample: "Married with higher education" households and "Unmarried without higher education" households. The most noticeable effect in this display is how rapidly the probability of using advice increases with higher levels of accumulated assets. However, for virtually all levels of household wealth, there is also a clear separation between the marital status/education level subgroups, with the "married with higher education" group more likely to employ the services of a financial advisor.

Table 8 summarizes the regression findings using this instrument in several different models that specify the same combination of control variables as in Table 5. The most important result here is that employing an instrumental estimate of the probability of using a financial

[19] In addition to the findings listed below, we have also calculated the estimated probability of financial advisor use based on Model 10 in Table 3, which supplements the previous set of explanatory factors with household health status and defined contribution plan eligibility. However, inasmuch as those latter two factors were statistically insignificant in the logistic regression analysis, their inclusion made no appreciable difference in creating the estimated probability of advisor variable. Consequently, we only report results for the more parsimonious model.

advisor instead of the actual decision to obtain advice does not change the main conclusion regarding the relationship between advisor use and retirement income replacement. That is, for each of the 14 model versions shown in the display, the coefficient on the Estimated Probability of Advisor variable is positive and statistically significant. In this case, that outcome can be interpreted as indicating that households whose financial and behavioral characteristics make them more likely to engage the services of a professional advisor have demonstrably higher RIR ratios. Further, the incremental impact of this advised instrument does not appear to diminish when the additional control variables are included; in fact, the parameter of interest appears to increase slightly from the single factor Model 1 (i.e., 2.0529) to the full multivariate specification in Model 14 (i.e., 2.1434). Thus, even after the endogenous nature of the financial advisor decision is addressed directly, this advice still is seen to provide substantial benefits to households in organizing their retirement investment strategies.

6.2 The Impact of Using Financial Advice on Investment Activity

In our earlier analysis of how the use of professional retirement planning advice altered a household's investment strategies, we were able to reach some tentative conclusions based on the differential behaviors of the advised and non-advised survey groups (e.g., advised households allocated more assets to equity investments and used target date funds to a greater extent). The development of the Estimated Probability of Advisor instrumental variable provides another way to assess more formally how receiving financial advice impacts investment activity.

Table 9 reports the results of several univariate logistic regression equations designed to link advisor use with myriad aspects of the retirement portfolio management process. The two panels in the display differ by whether the explanatory factor in question is the binary indicator variable for actual advisor usage (Panel A) or the Estimated Probability of Advisor usage instrumental variable (Panel B). These regressors are then employed in an attempt to explain several different observed investment behaviors, including (i) whether annual household savings exceeds the sample-wide mean of 9.2 percent, (ii) whether the equity allocation exceeds the sample-wide mean of 38.8 percent; (iii) whether the household has developed a written financial plan, (iv) whether target date funds are used, (v) whether target risk funds are used, and (vi) whether the household owns longevity insurance.

The findings in Panel A essentially reproduce in regression form some of the more salient differences between the advised and non-advised subgroups highlighted in Table 2. As such,

these new results emphasize the statistical strength of the incremental effect that receiving financial advice has on the structure of the retirement portfolio; in fact, each of the listed investment decisions is positively affected for a household that employs a professional advisor. The benefit of then revisiting these relationships with the estimated advice probability form of the explanatory variable in Panel B is that this instrument also controls for other factors that could influence portfolio management decision making (e.g., household assets, education level). In that respect, it is interesting to note that each of the reported parameters in Panel B remains statistically significant and positive. Although the nature of the instrumental variable makes interpreting the estimated parameter more challenging, it remains the case that an increase in this factor makes it more likely that the household will have higher-than-average savings, allocate more assets to equity investments, implement a financial plan, use target date and target risk funds, and obtain longevity insurance. Taken collectively, these are the decisions that lead to the generation of an enhanced level of retirement income replacement.

6.3 Determinants of Advisor Use and Retirement Income Replacement: Sensitivity Analysis

As a last consideration, we examine the economic impact that changes in various household characteristics would have on the estimated probability of using financial advice and the estimated net retirement income replacement ratio. The control variables for this sensitivity analysis include both the non-binary (household assets, household income, age) and binary (marital status, higher education level, household health status, defined contribution plan eligibility) characteristics summarized previously in Table 4. The overall sample mean values for each of these variables are shown in the second column on Table 10, which replicates that the sample-wide averages for the probability of using advice and net RIR are 23.0 and 48.5 percent, respectively.

For a base case scenario, we begin by taking the sample average values for the non-binary variables, which we then supplement with the presence (i.e., 1 if yes, 0 if no) of just health status among the binary variables. This scenario leads to substantial declines in both advised probability and RIR level (13.1 and 27.9 percent, respectively), mainly because of the assumption that members of the household have no post-high school education. When this regime is adjusted to include the presence of higher education (Scenario 5), the probability of using an advisor (18.5 percent) and net RIR (30.9 percent) statistics both increase. Conversely, when also being married is the only difference from the base case assumptions (Scenario 4), the

values of the two effect variables move in opposite directions, with the advised probability increasing to 17.0 percent and the RIR ratio falling to 23.1 percent.

The most dramatic impacts occur when the non-binary controls are allowed to change. For these factors, we considered the effect induced by one standard deviation increases from the sample mean levels (e.g., household total assets increase from $398 to $1,344; household annual income increase from $116 to $198; respondent age increase from 42.7 years to 54.6 years). Of these three controls, the impact of a change in household assets is the most substantial. From Scenario 1, a one standard deviation movement in accumulated wealth almost doubles the probability that the household will use a financial advisor (to 24.4 percent) but more than triples net RIR (to 86.0 percent) by significantly enhancing the scale of the replacement spending that can be generated. On the other hand, a singular increase in either respondent age (Scenario 3) or annual income (Scenario 2) actually reduces the RIR level—and hence the value of receiving financial advice—to 11.2 and 7.9 percent, respectively, but for very different reasons. In the case of the former, an older household will have less time before retirement for the benefits of the financial advice to take effect. In the latter case, a markedly larger current income level will be harder to reproduce in retirement with any given current asset portfolio.

Finally, the joint impact of increases in several control characteristics can be quite large. This is best seen in Scenario 8, which assumes one standard deviation increases in assets, income, and age, while also assuming a household that is married, better educated, and healthy. In that case, both the probability of using a financial advisor and the non-entitlement portion of retirement income replacement surge to the respective levels of 47.3 and 68.5 percent. It is interesting to note in this scenario that the beneficial effects of higher assets and higher education on RIR are more than sufficient to offset the negative impact of being older and earning a higher current income.

7. Conclusions

Planning for a successful retirement demands considerable financial acumen on the part of the investor. However, many individuals do not possess the requisite skills to create and manage an investment portfolio capable of producing the sufficient and sustainable stream of future annual spending that defines retirement success. Not surprisingly, then, investors frequently engage professionals from the financial services industry to assist them in the planning process. Often, this financial advice is intended to increase the individual's basic financial literacy, but it can

take on many other forms as well, including the design of more sophisticated asset allocation strategies. While Inderst and Ottaviani (2012a) and Mullainathan, Noeth, and Schoar (2012) both investigate the agency conflicts inherent in this advisor-advisee relationship, the majority of the research on the topic has focused on two alternative questions: (i) What are the demographic and behavioral factors that characterize the recipients of financial advice?; and (ii) What is the economic value of this counsel and does it significantly increase the investment outcomes of those who use it?

In this study, we address these questions with two specific innovations. First, we develop a new data sample based on an extensive survey of more than 4,000 U.S. working households, some of which employed financial advisors in their retirement investing activities. Second, we introduce a new metric—retirement income replacement—to assess the value added by financial advisors and adapt the empirical methodology in Harlow and Brown (2016, 2017) to estimate this statistic for each of the surveyed households. Our main results are as follows. As to what defined the 23 percent of the survey sample who engaged a registered advisor, we document that households in the advised group tended to be wealthier in terms of both accumulated assets and annual income, married, more highly educated, more confident in their retirement planning, and more disciplined in their investment process. This is consistent with Collins (2012) observation that financial advice is more likely a complement to existing financial competency than a substitute. Beyond that, we also report a sizeable and significant difference in retirement income replacement ratios between the advised and non-advised subsamples, with the retirement spending level for the former averaging more than 100 percent of pre-retirement income (the sample-wide average was 82.4 percent). After controlling for other explanatory factors (e.g., wealth, marital status, education level), the use of a financial advisor adds more than 15 percentage points to the household's income replacement measure. This finding offered strong support for the conclusion that financial advice did indeed add significant and positive value in planning for retirement.

Maybe the biggest opportunity that can be accomplished in future research is to more precisely attribute the channels by which obtaining financial advice adds to the economic well-being of prospective retirees. We know that working with a professional counselor clearly enhances a household's financial discipline (e.g., promotes greater savings, leads to the development of formal financial planning tools), even after adjusting for the propensity of the individuals in question to be more financially literate to begin with. However, it is difficult to

specify which portfolio and lifestyle adjustments might have led to the marked increase in retirement income replacement levels shown in our findings. In fact, it may well be that it is the confluence of multiple decisions that an advised investor makes that leads to the collective outcomes we observed. Further, it would be interesting to explore the behavioral implications of the result that advised investors are significantly more confident in both the process and the expected outcomes associated with their retirement planning. Is this the result of attaining an increased level of confidence from working with a financial advisor or did an existing level of confidence lead to the decision to engage the counselor in the first place? The work of Bucher-Koenen and Koenen (2015) and Agnew et al. (2016), respectively, suggest that either possibility could be true.[20] Unfortunately, the information that can be extracted from the Brightwork Partners survey, as extensive as it is, does not permit making such refined distinctions. Thus, while using professional retirement planning advice does appear to add substantial value, establishing exactly why that is the case remains a topic for further investigation.

[20] Closely related to the role that investor confidence plays in the decision-making process is the tendency for individuals with certain demographic characteristics (e.g., age, gender) to exhibit the behavioral heuristic bias of overconfidence. The ramifications of this possibility fall outside the bounds of this study, but have been well explored elsewhere; see, for instance, Barber and Odean (2001), Barberis and Thaler (2003), and Bhandari and Deaves (2006). In their analysis of subjective financial literacy, Bellofatto, D'Hondt, and De Winne (2018) document that individuals who think they are more financially literate actually do make "smarter" investment decisions.

Appendix: Representative Questions from Brightwork Partners' Household Retirement Survey

The following list of questions comprises a representative sample of the information solicited on Brightwork Partners' survey of attitudes and activity associated with the retirement planning process. The survey was administered in January 2015 to 4,004 households located throughout the United States. For expositional convenience, the listed questions are grouped into broader categories; these category descriptors did not appear on the survey itself.

A. Respondent Background

- Are you male or female?
- In what year were you born?
- In what state do you reside?
- What is the highest level of education you have completed?
  - Eighth grade or less
  - High School
  - Vocational training after high school
  - Some college
  - Four-year college degree
  - Graduate or professional degree beyond college
- What is your marital status?
  - Single, never married
  - Married
  - Unmarried living with partner
  - Separated
  - Divorced
  - Widowed

B. Professional Affiliation

- Which one of the following industries most nearly describes your work?
  - Construction
  - Educational services
  - Healthcare and social assistance
  - Financial
  - Information
  - Leisure and hospitality
  - Manufacturing
  - Agriculture, natural resources, or mining
  - Professional or business services
  - Trade, transportation, or utilities
  - Other services
  - Public administration
  - Other

C. Financial Planning

- Does this household have a formal, written financial plan spelling out your expected expenses and income in retirement and specifying the strategies you will use to achieve your retirement income objectives?
  - Has such a financial plan
  - Does not have such a financial plan
- Does this plan factor in health care costs that you don't expect to be covered by insurance?
  - Factors in health care costs
  - Does not factor in health care costs
- Does this household have longevity insurance by which we mean a special insurance policy which provides guaranteed income for life beginning at an advanced age, usually around 80?
  - Has longevity insurance
  - Does not have longevity insurance
- Please indicate below the workplace retirement programs in which you are eligible to participate, even if you aren't currently contributing or vested right now. Do you have a balance in this plan, or not?

	Eligible	Contributing		Balance	
		Contributing	Not Contributing	Balance	No Balance
1. 401(k) plan, typically available to employees of for-profit companies					
2. Profit sharing or money purchase plan, typically available to employees of for-profit companies					
3. SEP or SIMPLE retirement plan, typically available to employees of small businesses					
4. 403(b) plan, typically available to employees of non-governmental not-for-profit organizations					
5. 457 plan, typically available to employees of state, county and local governments					
6. Other type of workplace retirement plan funded mainly by you					
7. Traditional defined benefit pension plan excluding cash balance plans					
8. Cash balance plan					
9. Other type of workplace retirement plan funded mainly by your employer					
10. None of the above					

D. Retirement Goals and Objectives

• Thinking about your income and investments in retirement, how important is each of the following? Please rank the importance of each of these to you: 1st, 2nd, or 3rd

Minimizing risk in your portfolio
Maximizing your income
Maximizing the amount you leave to heirs

• People save for different reasons. For each of the savings objectives below, please indicate to what extent it is a savings objective for you.

	Not a Savings Objective at All	Minor Savings Objective	Major Savings Objective
1. Retirement			
2. A child's education			
3. A major purchase or expenditure at some point in the future (such as a home, car, boat or vacation)			
4. Paying down debt			
5. Saving for unexpected expenses apart from health care			
6. Saving for health care expenses			
7. Building an estate for your heirs			

E. Investment Confidence

• How confident are you about each of the following aspects of your retirement?

.	Not confident at all	Not very confident	Somewhat confident	Very confident
1. Knowing how much money you will need for retirement				
2. Knowing how much money you will need for health care expenses in retirement				
3. Knowing how you will cover health care expenses in retirement				
4. Being ready for retirement financially				
5. Being able to count on receiving your full Social Security benefits in retirement				

• How confident are you that you've made the right decision with each of the following aspects of your retirement plan at work?

	Not confident at all	Not very confident	Somewhat confident	Very confident
1. The amount of money that you are contributing				
2. The investments you've selected				
3. The way you have your assets allocated among stocks, bonds and cash				

F. Use of Professional Financial Advice

• Do you currently have a relationship with a professional financial advisor—that's someone you pay either through fees or commissions—to assist you in financial decisions, financial product selection, or in selecting providers of financial services, or don't you?

Have a current relationship with a paid financial advisor
Do not have a current relationship with a paid financial advisor

• In the past five years, have you had a relationship with a professional financial advisor--that's someone you paid either through fees or commissions--to assist you in financial decisions, financial product selection, or in selecting providers of financial services, or haven't you?

Have had a paid financial advisor
Have not had a paid financial advisor

• Is that advisor connected to your household's current workplace retirement plan?

Yes
No

G. Income and Savings

• Not counting any income earned by other adults in your household, what was your personal income from all sources before taxes in 2013? What was the income earned by other adults in your household from all sources before taxes in 2013?

	Personal Income	Other Adult Income
None		
$1 to less than $25,000		
$25,000 to less than $35,000		
$35,000 to less than $50,000		
$50,000 to less than $75,000		
$75,000 to less than $100,000		
$100,000 to less than $125,000		
$125,000 to less than $150,000		
$150,000 to less than $175,000		
$175,000 to less than $200,000		
$200,000 to less than $225,000		
$225,000 to less than $250,000		
$250,000 or more		

• What would you say is the combined current market value of all of your retirement account(s) at work? If you have more than one, we're asking about the total value of all accounts with your current employer.

Zero
More than zero but less than $1,000
$1,000 to less than $2,500
$2,500 to less than $5,000
$5,000 to less than $15,000
$15,000 to less than $25,000
$25,000 to less than $50,000
$50,000 to less than $75,000
$75,000 to less than $100,000
$100,000 to less than $250,000
$250,000 to less than $500,000
$500,000 to less than $750,000
$750,000 to less than $1,000,000
$1,000,000 or more

• What is the combined current market value of all the balances that this household has in retirement plans still at former employers?

• What's the current market value of all the cash value life insurance held by this household? To be clear, we're asking about its cash value, *not* the death benefit associated with the insurance.

• What is the current market value of the variable annuities owned by this household?

• Subtracting any mortgages you may have on that property (or properties) from its market value, about how much equity would you say you have in the real estate you own outside a business?
• Do you or does a member of your household expect to receive an inheritance someday? In today's dollars, about how much do you expect that inheritance to be?

H. Asset Allocation

• About what percentage of that balance do you hold in?

1. Funds you select based on the risk levels of the funds, often designated as aggressive, moderate or conservative	%
2. Funds you select based on the year in which you expect to retire, often designated by the year itself, 2015, for example or 2030	%
3. Other types of investments	%

• Thinking about your investable assets as stocks or stock mutual funds; bonds or bond mutual funds; and money market mutual funds and savings and checking accounts, what is the current market value of each of these types of assets held by your household? Please include tax-deferred assets that you or your spouse may have rolled to an IRA from a workplace retirement plan. Please exclude the value of any assets that you or a member of your household may still hold in a retirement plan at a current employer

	Stocks or stock mutual funds	Bonds or bond mutual funds	Money market mutual funds and checking and savings accounts
None			
Less than $1,000			
$1,000 to less than $2,500			
$2,500 to less than $5,000			
$5,000 to less than $15,000			
$15,000 to less than $25,000			
$25,000 to less than $50,000			
$50,000 to less than $100,000			
$100,000 to less than $250,000			
$250,000 to less than $500,000			
$500,000 to less than $750,000			
$750,000 to less than $1.0m			
$1.0m to less than $1.5m			
$1.5m to less than $2.0m			
$2.0m to less than $2.5m			
$2.5m to less than$5.0m			
$5.0m to less than $7.5m			
$7.5m to less than $10m			
$10.0m or more			

I. Health Status

• What is your height (__ feet, __ inches) and weight (__ pounds), or would rather not say?
• Have you or has any member of your household used any form of tobacco—that could be cigarettes, cigars, pipes or smokeless tobacco—on a consistent basis in the last five years?

Yes, self only
Yes, other adult only
Yes, both
No, neither

• Have you or has any member of your household ever been diagnosed with?

	Self	Other Adult	Neither
1. Cancer of any type			
2. Type 2 diabetes (adult onset, not insulin-dependent)			
3. High blood pressure (typically 140/90 mmHG or higher)			
4. Cardiovascular disease of any type apart from high blood pressure			
5. High cholesterol (typically total cholesterol of 200 mg/dL or higher)			

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Table 1

Demographic Characteristics of Brightwork Partners' Household Retirement Survey

Description	Household Assets ($000)	Household Income ($000)	Use of Advisor (%)	Age (yrs)	Marital Status (% Married)	Higher Education (%)	Healthy Household (%)	DC Plan Eligible (%)	Retirement Income Replacement (%)
Overall Sample (4,004 Obs.)	397.5	116.0	23.0	42.7	63.9	60.5	39.0	50.9	82.4
A. Industry of Primary Employment									
Construction	487.6	111.0	23.7	44.3	71.0	39.8	31.7	36.6	97.4
Education	325.1	113.6	24.9	41.4	65.5	81.5	42.4	55.0	83.9
Healthcare	399.9	119.7	22.3	41.8	63.3	60.6	39.2	55.6	80.1
Financial	504.5	137.1	24.1	40.2	68.9	69.7	36.2	58.0	87.6
Information	452.9	130.5	22.5	40.8	65.3	72.5	37.4	60.8	82.0
Leisure	363.9	91.0	23.9	40.4	54.3	45.7	38.4	38.4	94.0
Manufacturing	430.7	123.6	23.0	43.9	67.4	54.2	36.8	64.0	81.2
Natural Resources	547.7	137.2	31.9	40.8	70.2	55.3	34.0	40.4	92.8
Business Services	532.8	133.5	27.5	42.6	64.3	73.0	45.3	49.9	83.2
Utilities	407.9	112.6	20.9	43.7	60.9	43.7	36.7	55.8	83.8
Other Services	230.2	96.7	15.6	42.4	58.2	45.3	39.5	37.5	73.9
Public Administration	383.2	114.8	22.4	44.5	63.8	73.0	36.2	56.1	94.1
Other	297.7	98.3	20.5	44.7	61.6	48.6	37.8	42.0	73.3
B. Region of Primary Residence									
Northeast	399.1	128.3	23.7	43.0	63.9	64.1	40.3	54.2	79.3
Midwest	380.1	107.6	25.8	43.0	65.8	58.2	37.0	51.2	82.6
South	334.8	107.5	19.6	42.5	63.6	59.2	39.1	48.5	81.6
West	504.8	124.9	23.9	42.4	62.5	61.3	39.6	50.6	86.4
C. State of Primary Residence (> 100 Obs.)									
California	591.6	136.0	23.3	41.6	62.2	65.6	40.1	50.8	89.1
Florida	324.5	100.6	18.9	44.1	60.8	55.4	40.1	46.8	81.3
Georgia	428.6	114.9	24.2	40.7	58.1	66.1	46.0	54.0	87.2
Illinois	467.8	117.5	30.3	42.2	62.8	62.4	30.7	51.4	88.6
Michigan	310.7	102.2	14.9	44.3	61.4	54.4	42.1	47.4	75.2
New Jersey	523.1	142.4	24.0	44.4	73.3	62.3	37.0	58.2	83.4
New York	483.4	139.1	27.6	43.0	58.1	64.1	40.2	55.2	85.9
North Carolina	289.5	97.1	13.9	43.0	72.1	53.3	34.4	47.5	73.8
Ohio	268.7	105.5	24.4	43.8	65.6	55.0	31.9	52.5	75.8
Pennsylvania	237.8	110.6	21.1	43.4	67.4	59.0	37.9	53.3	72.8
Texas	375.8	118.0	17.5	42.5	66.3	59.2	39.6	49.6	83.2
Virginia	287.1	114.0	17.8	39.9	65.3	69.5	43.2	51.7	73.4
Wisconsin	351.5	99.6	25.2	44.5	63.1	60.2	51.5	54.4	79.5

This table summarizes a representative sample of the data gathered in the Brightwork Partners LLC survey of retirement saving behavior and attitudes. The survey was administered to 4,004 households throughout the United States in January 2015. The display lists mean values for several queried variables, including household assets and income, use of a paid financial advisor, age, marital status, and educational level of respondent, health status of household, and whether the household is eligible to participate in a defined contribution retirement plan. The last column reports the mean value of retirement income replacement as defined by equation (1). Statistics are listed for the overall sample as well as by the industry of primary employment and the geographical locale of primary residence.

Table 2

Investment Attitude and Activity Differences Between Advised and Non-Advised Survey Respondents

	Variable Description	Overall Sample	Non-Advised Group	Advised Group	Difference: (Advised minus Non-Advised)	P-value of Difference
	Number of Households	4,004	3,085	919	---	---
A. Median Values						
1	Household Annual Savings ($)	8,000	5,375	18,750	13,375	(< 0.001)
2	Household Annual Savings (% of Income)	9.2	6.8	15.3	8.5	(< 0.001)
B. Mean Values						
1	Household Annual Savings ($)	17,348	13,738	29,463	15,725	(< 0.001)
2	Household Annual Savings (% of Income)	13.3	11.5	19.4	7.9	(< 0.001)
3	Asset Allocation to Equities (%)	38.8	36.1	47.9	11.8	(< 0.001)
4	Use Target Date Funds (%)	77.0	74.9	81.8	6.9	(0.002)
5	Use Target Risk Funds (%)	88.3	86.5	92.6	6.1	(< 0.001)
6	Has Written Financial Plan (%)	18.5	10.9	44.0	33.1	(< 0.001)
7	Own Longevity Insurance (%)	10.2	7.6	18.9	11.3	(< 0.001)
8	Paid Advisor is Associated with 401k Plan (%)	31.2	22.1	32.7	10.6	(0.020)
9	Minimizing Risk is Primary Objective (%)	12.9	10.9	19.6	8.7	(< 0.001)
10	Maximizing Income is Primary Objective (%)	81.9	84.0	74.8	-9.2	(< 0.001)
11	Maximizing Bequest is Primary Objective (%)	5.2	5.1	5.7	0.6	(< 0.001)
12	Confident in Making the Most of 401k (%)	20.0	15.5	30.1	14.6	(< 0.001)
13	Confident in Decisions About Saving (%)	20.9	17.4	30.3	12.9	(< 0.001)
14	Confident in Investments Selected (%)	19.1	15.5	28.6	13.1	(< 0.001)
15	Confident in Asset Allocation Decision (%)	19.1	15.5	28.6	13.1	(< 0.001)
16	Saving for Retirement is a Goal (%)	68.6	64.9	80.8	15.9	(< 0.001)
17	Saving for Child's Education is a Goal (%)	23.0	20.9	30.0	9.1	(< 0.001)
18	Saving for a Major Purchase is a Goal (%)	26.6	26.6	26.6	-0.0	(0.955)
19	Paying Down Debt is a Goal (%)	41.4	43.8	33.5	-10.3	(< 0.001)
20	Saving for Healthcare Expenses is a Goal (%)	23.3	21.0	31.1	10.1	(< 0.001)
21	Building an Estate is a Goal (%)	12.5	10.6	19.0	8.4	(< 0.001)
22	Confident in Amount Needed for Retirement (%)	9.7	7.2	18.3	11.1	(< 0.001)
23	Confident in Amount Needed for Healthcare (%)	6.8	5.1	12.7	7.6	(< 0.001)
24	Confident in Covering Healthcare Expenses (%)	8.9	7.2	14.6	7.4	(< 0.001)
25	Confident in Financially Ready to Retire (%)	10.7	8.5	17.8	9.3	(< 0.001)
26	Confident in Receiving Social Security Benefits (%)	10.1	8.8	14.3	5.5	(< 0.001)

This table reports median and mean values for several variables obtained from the Brightwork Partners retirement behavior survey of 4,004 U.S. households. Results are reported for the overall sample as well as two subgroups according to whether the household either did not (non-advised) or did (advised) formally obtain financial advice on the retirement planning process. The survey variables are grouped into the following categories: Income and Savings, Asset Allocation, Financial Planning, Retirement Goals, Investor Confidence-Retirement Process, Objectives in Retirement, and Investor Confidence-Retirement Spending. The difference in advised and non-advised outcomes is also reported and p-values associated with the estimated differences are listed parenthetically.

Table 3

The Determinants of the Decision to Use a Financial Advisor

Model	Intercept	Household Assets (ln $000)	Household Income ($000)	Age	Marital Status	Higher Education	Healthy Household	DC Plan Eligible	Model Chi-Square
1	-3.1257 (< 0.001)	0.4033 (< 0.001)							446.81 (< 0.001)
2	-1.9744 (< 0.001)		0.0061 (< 0.001)						199.79 (< 0.001)
3	-2.0670 (< 0.001)			0.0197 (< 0.001)					37.99 (< 0.001)
4	-1.7056 (< 0.001)				0.7224 (< 0.001)				76.76 (< 0.001)
5	-1.6954 (< 0.001)					0.7413 (< 0.001)			85.00 (< 0.001)
6	-1.1697 (< 0.001)						-0.1079 (0.164)		1.94 (0.164)
7	-1.4790 (< 0.001)							0.4944 (< 0.001)	42.52 (< 0.001)
8	-3.1992 (< 0.001)	0.3512 (< 0.001)	0.0026 (< 0.001)						708.99 (< 0.001)
9	-3.9871 (< 0.001)	0.3216 (< 0.001)	0.0020 (< 0.001)	0.0122 (< 0.001)	0.3062 (< 0.001)	0.4111 (< 0.001)			517.51 (< 0.001)
10	3.9424 (< 0.001)	0.3206 (< 0.001)	0.0020 (< 0.001)	0.0116 (< 0.001)	0.3046 (0.002)	0.4218 (0.001)	-0.0746 (0.385)	0.0101 (0.905)	518.28 (< 0.001)

This table presents a series of logistic regression models in which the dependent variable is an indicator of whether the 4,004 surveyed households either did (= 1) or did not (= 0) use a professional financial advisor in their retirement planning process. Prospective determinants include total household assets (ln $), annual household income ($), respondent age (years), and indicator variables for marital status (= 1 if married), higher education (= 1 if beyond high school), household health status (= 1 if completely healthy), and whether eligible for a workplace defined contribution plan (= 1 if yes). P-values associated with the estimated coefficients are listed parenthetically.

Table 4

Retirement Income Replacement in Advised and Non-Advised Households

	Variable Description	Overall Sample	Non-Advised Group	Advised Group	Difference: (Advised minus Non-Advised)	P-value of Difference
	Number of Households	4,004	3,085	919	---	---
A. Median Values						
1	Retirement Income Replacement (%)	63.0	58.8	81.2	22.4	(< 0.001)
2	RIR without Social Security (%)	28.2	22.2	50.9	28.7	(< 0.001)
3	Age (yrs)	43.0	42.0	45.0	3.0	(< 0.001)
4	Household Income ($)	100,000	87,500	125,000	37,500	(< 0.001)
5	Household Assets ($)	97,500	68,500	350,000	281,500	(< 0.001)
B. Mean Values						
1	Retirement Income Replacement (%)	82.4	75.7	104.8	29.1	(< 0.001)
2	RIR without Social Security (%)	48.5	40.5	75.2	34.7	(< 0.001)
3	Age (yrs)	42.7	42.1	44.8	2.7	(< 0.001)
4	Household Income ($)	116,015	105,503	151,303	5,800	(< 0.001)
5	Household Assets ($)	397,534	270,917	822,573	551,651	(< 0.001)
6	Home Equity ($)	36,618	25,449	74,112	48,662	(< 0.001)
7	Marital Status (% Married)	63.9	60.4	75.8	15.4	(< 0.001)
8	Male Survey Respondent (%)	50.1	49.6	51.8	2.2	(0.242)
9	Higher Education (%)	60.5	56.7	73.3	16.6	(< 0.001)
10	Healthy Household (%)	39.0	39.5	37.0	-2.5	(0.164)
11	Eligible for Defined Contribution Plan (%)	50.9	48.1	60.3	12.2	(< 0.001)

This table reports median and mean values for several variables obtained for the 4,004 surveyed U.S. households. Results are reported for the overall sample as well as two subgroups according to whether the household either did not (non-advised) or did (advised) formally obtain financial advice on the retirement planning process. The primary survey variables of interest are the household's retirement income replacement (RIR) ratio, as computed by (1), both gross and net of Social Security benefits. Additional survey variables shown correspond to relevant financial and personal background characteristics of the survey respondents. The difference in advised and non-advised outcomes is also reported and p-values associated with the estimated differences are listed parenthetically.

Table 5

Financial Advice as a Determinant of Retirement Income Replacement Level: Regression Analysis

Model	Intercept	Use of Advisor	Household Assets (ln $000)	Household Income ($000)	Age	Marital Status	Higher Education	Healthy Household	DC Plan Eligible	Fixed Effects?	Adjusted R-Sq
1	0.4049 (< 0.001)	0.3471 (< 0.001)								No	0.05
2	0.2885 (< 0.001)	0.1100 (< 0.001)	0.0004 (< 0.001)							No	0.39
3	0.3179 (< 0.001)	0.3093 (< 0.001)		0.0008 (< 0.001)						No	0.06
4	0.7280 (< 0.001)	0.3681 (< 0.001)			-0.0077 (< 0.001)					No	0.06
5	0.4178 (< 0.001)	0.3504 (< 0.001)				-0.0213 (0.328)				No	0.05
6	0.3311 (< 0.001)	0.3254 (< 0.001)					0.1302 (< 0.001)			No	0.06
7	0.4188 (< 0.001)	0.3462 (< 0.001)						-0.0349 (0.101)		No	0.05
8	0.2490 (< 0.001)	0.3075 (< 0.001)							0.3243 (< 0.001)	No	0.10
9	0.4185 (< 0.001)	0.1463 (< 0.001)	0.0005 (< 0.001)	-0.0014 (< 0.001)						Yes	0.41
10	0.9078 (< 0.001)	0.1738 (< 0.001)	0.0005 (< 0.001)	-0.0015 (< 0.001)	-0.0114 (< 0.001)					Yes	0.45
11	0.9110 (< 0.001)	0.1749 (< 0.001)	0.0005 (< 0.001)	-0.0015 (< 0.001)	-0.0113 (< 0.001)	-0.0161 (0.353)				Yes	0.45
12	0.8723 (< 0.001)	0.1678 (< 0.001)	0.0005 (< 0.001)	-0.0016 (< 0.001)	-0.0111 (< 0.001)	-0.0159 (0.357)	0.0677 (< 0.001)			Yes	0.45
13	0.9323 (< 0.001)	0.1658 (< 0.001)	0.0005 (< 0.001)	-0.0016 (< 0.001)	-0.0118 (< 0.001)	-0.0182 (0.292)	0.0811 (< 0.001)	-0.0903 (< 0.001)		Yes	0.46
14	0.8375 (< 0.001)	0.1513 (< 0.001)	0.0005 (< 0.001)	-0.0016 (< 0.001)	-0.0116 (< 0.001)	-0.0282 (0.093)	0.0611 (< 0.001)	-0.0911 (< 0.001)	0.2375 (< 0.001)	Yes	0.49

This table presents a series of regression models in which the dependent variable is the retirement income replacement (RIR) ratio for the 4,004 surveyed households, as estimated by (1) and adjusted to net out Social Security benefits. The primary determinant variable is an indicator of whether the households either did (= 1) or did not (= 0) use a professional financial advisor in their retirement planning process. Additional control variables include total household assets (ln $), annual household income ($), respondent age (years), and indicator variables for marital status (= 1 if married), higher education (= 1 if beyond high school), household health status (= 1 if completely healthy), and whether eligible for a workplace defined contribution plan (= 1 if yes). P-values associated with the estimated coefficients are listed parenthetically. Models 9-14 include fixed effect controls for a household's industry of employment, region of primary residence, and state of primary residence.

Table 6

Financial Advice and Retirement Income Replacement: Nearest-Neighbor Matched Sample Comparison

A. Comparison of Variables Used to Determine Nearest-Neighbor Propensity Score

Sample	Frequency	Household Assets ($000)	Household Income ($000)	Age (yrs)	Marital Status (% Married)	Higher Education (%)	Healthy Household (%)	DC Plan Eligible (%)
Advised	866	608.195	139.480	44.6536	0.7448	0.7229	0.3753	0.5912
Non-Advised Neighbor	866	562.168	142.018	44.7968	0.7737	0.7240	0.3430	0.6132
Difference (p-value)	---	46.027 (0.339)	-2.538 (0.553)	-0.1432 (0.796)	-0.0289 (0.160)	-0.0012 (0.957)	0.0323 (0.161)	-0.0219 (0.351)

B. Comparison of Outcome Variables for Advised and Non-Advised Neighbor Samples

Sample	Frequency	Retirement Income Replacement (without SS)	Retirement Income Replacement (with SS)	Household Savings (%)	Household Savings ($)	Equity Allocation (%)	Has Written Plan (%)	Use of Target Date Fund (%)	Use of Target Risk Fund (%)	Owns Longevity Insurance (%)
Advised	866	0.6738	0.9786	0.1899	26187.96	0.4789	0.4180	0.8092	0.9198	0.1709
Non-Advised Neighbor	866	0.5164	0.8203	0.1433	22433.69	0.4325	0.1409	0.7667	0.9021	0.0797
Difference (p-value)	---	0.1574 (< 0.001)	0.1583 (< 0.001)	0.0465 (< 0.001)	3754.27 (0.016)	0.0464 (0.003)	0.2771 (< 0.001)	0.0426 (0.113)	0.0177 (0.329)	0.0912 (< 0.001)

This table reports statistical differences in average values for several variables associated with households in the retirement behavior survey that either did or did not use a paid financial advisor. The non-advised neighbor sample is constructed by matching each advised household with the non-advised household having the closest propensity score (PS) based on the following control variables: household assets, household income, age, marital status, higher education, healthy household, and DC plan eligibility. Nearest-neighbor matching was done without replacement in the overall non-advised population and was subject to PS distance limits criteria. Panel A lists mean control variable values for the advised and non-advised neighbor samples. Panel B reports mean outcome variable values for the advised and non-advised neighbor samples, including the retirement income replacement (RIR, without or with Social Security benefits) variables. P-values associated with the mean variable differences are listed parenthetically.

Table 7

Incremental Impact of Nearest-Neighbor Determinants on Retirement Income Replacement

Sample	Frequency	RIR (without SS)	RIR (with SS)	Household Savings (%)	Household Savings ($)	Equity Allocation (%)	Has Written Plan (%)	Target Date Fund (%)	Target Risk Fund (%)	Longevity Insure (%)
A. Base Case ***(Non-Advised Matching Variables: Household Assets, Household Income, Age, Marital Status, Higher Education, Healthy Household, DC Plan Eligible)***										
Advised	866	0.6738	0.9786	0.1899	26187.96	0.4789	0.4180	0.8092	0.9198	0.1709
Non-Advised		0.5164	0.8203	0.1433	22433.69	0.4325	0.1409	0.7667	0.9021	0.0797
Difference		0.1574	0.1583	0.0465	3754.27	0.0464	0.2771	0.0426	0.0177	0.0912
(p-value)		(< 0.001)	(< 0.001)	(< 0.001)	(0.016)	(0.003)	(< 0.001)	(0.113)	(0.329)	(< 0.001)
B. Incremental Non-Advised Neighbor Matching Variable										
1. Household Savings ($)										
Advised	859	0.6561	0.9606	0.1834		0.4780	0.4179	0.8081	0.9246	0.1735
Non-Advised		0.5517	0.8557	0.1629		0.4390	0.1572	0.7628	0.9038	0.0990
Difference		0.1043	0.1049	0.0205		0.0390	0.2608	0.0454	0.0208	0.0745
(p-value)		(0.003)	(0.003)	(0.021)		(0.012)	(< 0.001)	(0.094)	(0.244)	(< 0.001)
2. Equity Allocation										
Advised	870	0.6742	0.9782	0.1914	26715.26		0.4207	0.8142	0.9219	0.1747
Non-Advised		0.5468	0.8489	0.1503	22741.87		0.1333	0.7626	0.8991	0.0885
Difference		0.1274	0.1293	0.0412	3973.39		0.2874	0.0516	0.0227	0.0862
(p-value)		(< 0.001)	(< 0.001)	(< 0.001)	(0.011)		(< 0.001)	(0.055)	(0.213)	(< 0.001)
3. Has Written Plan										
Advised	799	0.6409	0.9532	0.1835	23524.37	0.4713		0.8108	0.9132	0.1652
Non-Advised		0.5517	0.8637	0.1561	22866.90	0.4228		0.7611	0.9159	0.1264
Difference		0.0892	0.0895	0.0275	657.47	0.0486		0.0497	-0.0027	0.0388
(p-value)		(0.014)	(0.015)	(0.003)	(0.673)	(0.003)		(0.080)	(0.888)	(0.028)
4. Uses Target Date Fund										
Advised	459	0.8623	1.1606	0.2535	34733.93	0.4950	0.4684		0.9103	0.2179
Non-Advised		0.6884	0.9817	0.2074	31050.76	0.4874	0.1547		0.9065	0.1024
Difference		0.1740	0.1789	0.0461	3683.17	0.0076	0.3137		0.0038	0.1155
(p-value)		(< 0.001)	(< 0.001)	(< 0.001)	(0.101)	(0.707)	(< 0.001)		(0.847)	(< 0.001)
5. Household Savings ($),Equity Allocation, Has Written Plan										
Advised	799	0.6430	0.9549	0.1817				0.7991	0.9165	0.1640
Non-Advised		0.5317	0.8413	0.1625				0.7647	0.9070	0.0964
Difference		0.1113	0.1136	0.0192				0.0094	0.0676	0.0676
(p-value)		(< 0.001)	(< 0.001)	(0.040)				(0.231)	(0.618)	(< 0.001)

This table highlights statistical differences in average values for retirement income replacement (RIR, without or with Social Security benefits) for surveyed households that either did or did not use a paid financial advisor. Panel A reproduces the non-advised neighbor base case (Table 6) constructed by matching each advised household with the non-advised household having the closest propensity score (PS) based on: household assets, household income, age, marital status, higher education, healthy household, and DC plan eligibility. Panel B lists advised/non-advised mean RIR differential values using alternative non-advised neighbor matching samples in which the base case variables used to calculate PS values are augmented sequentially with the following factors: (i) Household Savings ($), (ii) Equity Allocation, (iii) Has Written Plan, (iv) Uses Target Date Fund, and (v) Household Savings ($), Equity Allocation, and Has Written Plan. All nearest-neighbor

matching was done without replacement in the non-advised population and was subject to PS distance limits criteria. P-values associated with the mean variable differences are listed parenthetically.

Table 8

Estimated Probability of Using a Financial Advisor as a Determinant of Retirement Income Replacement Level

Model	Intercept	Estimated Probability of Advisor	Household Assets (ln $000)	Household Income ($000)	Age	Marital Status	Higher Education	Healthy Household	DC Plan Eligible	Fixed Effects?	Adjusted R-Sq
1	0.0134 (0.439)	2.0529 (< 0.001)								No	0.21
2	0.2312 (< 0.001)	0.4125 (< 0.001)	0.0004 (< 0.001)							No	0.39
3	0.0886 (< 0.001)	2.8765 (< 0.001)		-0.0023 (< 0.001)						No	0.25
4	0.5633 (< 0.001)	2.3677 (< 0.001)			-0.0146 (< 0.001)					No	0.27
5	0.1071 (< 0.001)	2.3712 (< 0.001)				-0.2609 (< 0.001)				No	0.24
6	0.0433 (0.019)	2.1816 (< 0.001)					-0.0981 (< 0.001)			No	0.21
7	0.0234 (0.219)	2.0508 (< 0.001)						-0.0245 (0.208)		No	0.21
8	-0.0422 (0.019)	1.8709 (< 0.001)							0.1915 (< 0.001)	No	0.23
9	0.3072 (< 0.001)	1.2386 (< 0.001)	0. 0004 (< 0.001)	-0.0023 (< 0.001)						Yes	0.43
10	0.9504 (< 0.001)	1.9865 (< 0.001)	0. 0004 (< 0.001)	-0.0031 (< 0.001)	-0.0167 (< 0.001)					Yes	0.51
11	0.9794 (< 0.001)	2.1649 (< 0.001)	0. 0004 (< 0.001)	-0.0030 (< 0.001)	-0.0165 (< 0.001)	-0.1239 (< 0.001)				Yes	0.52
12	1.0485 (< 0.001)	2.4173 (< 0.001)	0. 0004 (< 0.001)	-0.0031 (< 0.001)	-0.0175 (< 0.001)	-0.1373 (< 0.001)	-0.1065 (< 0.001)			Yes	0.52
13	1.1021 (< 0.001)	2.4034 (< 0.001)	0.0003 (< 0.001)	-0.0031 (< 0.001)	-0.0182 (< 0.001)	-0.1386 (< 0.001)	-0.0934 (< 0.001)	-0.0821 (< 0.001)		Yes	0.52
14	1.0205 (< 0.001)	2.1434 (< 0.001)	0. 0004 (< 0.001)	-0.0030 (< 0.001)	-0.0173 (< 0.001)	-0.1318 (< 0.001)	-0.0871 (< 0.001)	-0.0838 (< 0.001)	0.1570 (< 0.001)	Yes	0.53

This table presents a series of regression models in which the dependent variable is the retirement income replacement (RIR) ratio for the 4,004 surveyed households, as estimated by (1) and adjusted to net out Social Security benefits. The primary determinant variable is an instrumental variable estimating the probability of whether a household uses a financial advisor, based on the logistic regression summarized in Model 9 of Table 3. Additional control variables include total household assets (ln $), annual household income ($), respondent age (years), and indicator variables for marital status (= 1 if married), higher education (= 1 if beyond high school), household health status (= 1 if completely healthy), and whether eligible for a workplace defined contribution plan (= 1 if yes). P-values associated with the estimated coefficients are listed parenthetically. Models 9-14 include fixed effect controls for a household's industry of employment, region of primary residence, and state of primary residence.

Table 9

The Effect of Using a Financial Advisor on Investment Activity

	A. Independent Variable: Use of Advisor Indicator			*B. Independent Variable: Use of Advisor Instrument*		
Dependent Variable	**Intercept**	**Estimated Parameter**	**Model Chi-Square**	**Intercept**	**Estimated Parameter**	**Model Chi-Square**
Household Saving Percentage Exceeds 9.2%	-0.2154 (< 0.001)	0.9495 (< 0.001)	151.55 (< 0.001)	-1.4457 (< 0.001)	6.4457 (< 0.001)	706.25 (< 0.001)
Equity Allocation Exceeds 38.8%	-0.1357 (< 0.001)	0.7435 (< 0.001)	94.32 (< 0.001)	-0.8716 (< 0.001)	3.9933 (< 0.001)	314.36 (< 0.001)
Has Written Financial Plan	-2.0985 (< 0.001)	1.8558 (< 0.001)	447.01 (< 0.001)	-2.7934 (< 0.001)	4.4995 (< 0.001)	352.48 (< 0.001)
Uses Target Date Funds	1.0931 (< 0.001)	0.4107 (0.002)	10.13 (0.002)	0.8721 (< 0.001)	1.1922 (0.003)	9.05 (0.003)
Uses Target Risk Funds	1.8608 (< 0.001)	0.6601 (< 0.001)	14.68 (< 0.001)	1.0733 (< 0.001)	3.3688 (< 0.001)	45.34 (< 0.001)
Owns Longevity Insurance	-2.5001 (< 0.001)	1.0458 (< 0.001)	87.85 (< 0.001)	-2.9342 (< 0.001)	2.9205 (< 0.001)	81.28 (< 0.001)

This table reports estimated parameters for a series of univariate logistic regressions assessing the impact of obtaining financial advice on the retirement investment process. The independent variable used is either the indicator variable for actual advisor use (Panel A) or the instrumental variable for estimated probability of advisor use based on Model 9 of Table 3 (Panel B). The set of dependent indicator variables include: (i) whether annual household savings exceeds the sample-wide mean of 9.2 percent, (ii) whether the equity allocation exceeds the sample-wide mean of 38.8 percent; (iii) whether the household has developed a written financial plan, (iv) whether target date funds are used, (v) whether target risk funds are used, and (vi) whether the household owns longevity insurance. P-values associated with the estimated coefficient are listed parenthetically.

Table 10

Impact of Control Variable Changes on the Estimated Probability of Using an Advisor and Retirement Income Replacement

Variable	Overall Sample	Base Case Scenario	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10
Household Assets ($000)	398	398	1,344	398	398	398	398	1,344	1,344	1,344	1,344	1,344
Household Income ($000)	116	116	116	198	116	116	116	198	198	198	198	198
Age (yrs)	42.7	42.7	42.7	42.7	54.6	42.7	42.7	42.7	54.6	54.6	54.6	54.6
Marital Status (% Married)	63.9	0	0	0	0	1	0	0	0	1	1	1
Higher Education (%)	60.5	0	0	0	0	0	1	0	0	1	1	1
Healthy Household (%)	39.0	1	1	1	1	1	1	1	1	1	0	0
Eligible for DC Plan (%)	50.9	0	0	0	0	0	0	0	0	0	0	1
Prob. of Using Advisor (%)	23.0	13.1	24.4	15.0	14.8	17.0	18.5	27.5	30.4	47.3	47.3	47.3
Retirement Income Replacement (%, without Social Security)	48.5	27.9	86.0	7.9	11.2	23.1	30.9	34.6	54.3	68.5	76.9	92.6

This table reports how the sample-wide mean values for a household's probability of using an advisor and its retirement income replacement level are impacted by changes in various financial and behavioral characteristics. Findings are listed for the overall sample averages, a base case scenario, and 10 alternative scenarios using different control variable combinations. For non-binary controls, adjustments consider one standard deviation increases in the mean values for household assets, household income, and age. For binary controls, adjustments consider the presence (1 if yes, 0 if no) of the underlying effect.

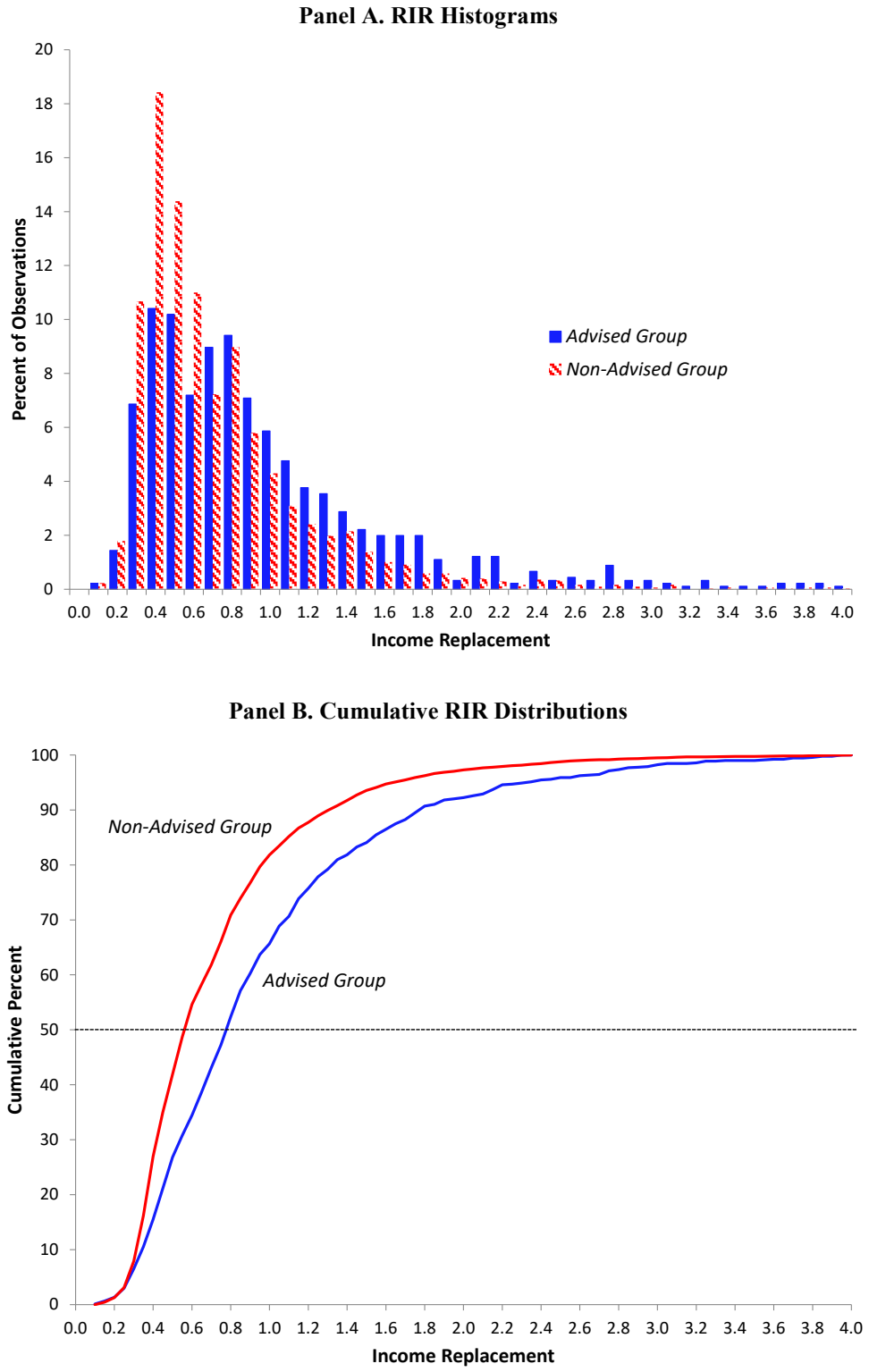

Figure 1

Retirement Income Replacement in Advised and Non-Advised Households

This figure displays the retirement income replacement (RIR) distributions estimated for the advised (blue, solid bars) and non-advised (red, striped bars) subgroups in the overall sample of 4,004 surveyed households. Panel A shows the frequency of households in the two subgroups occurring at each RIR level while Panel B indicates the cumulative percentage of those respective subgroups that achieve a given RIR level.

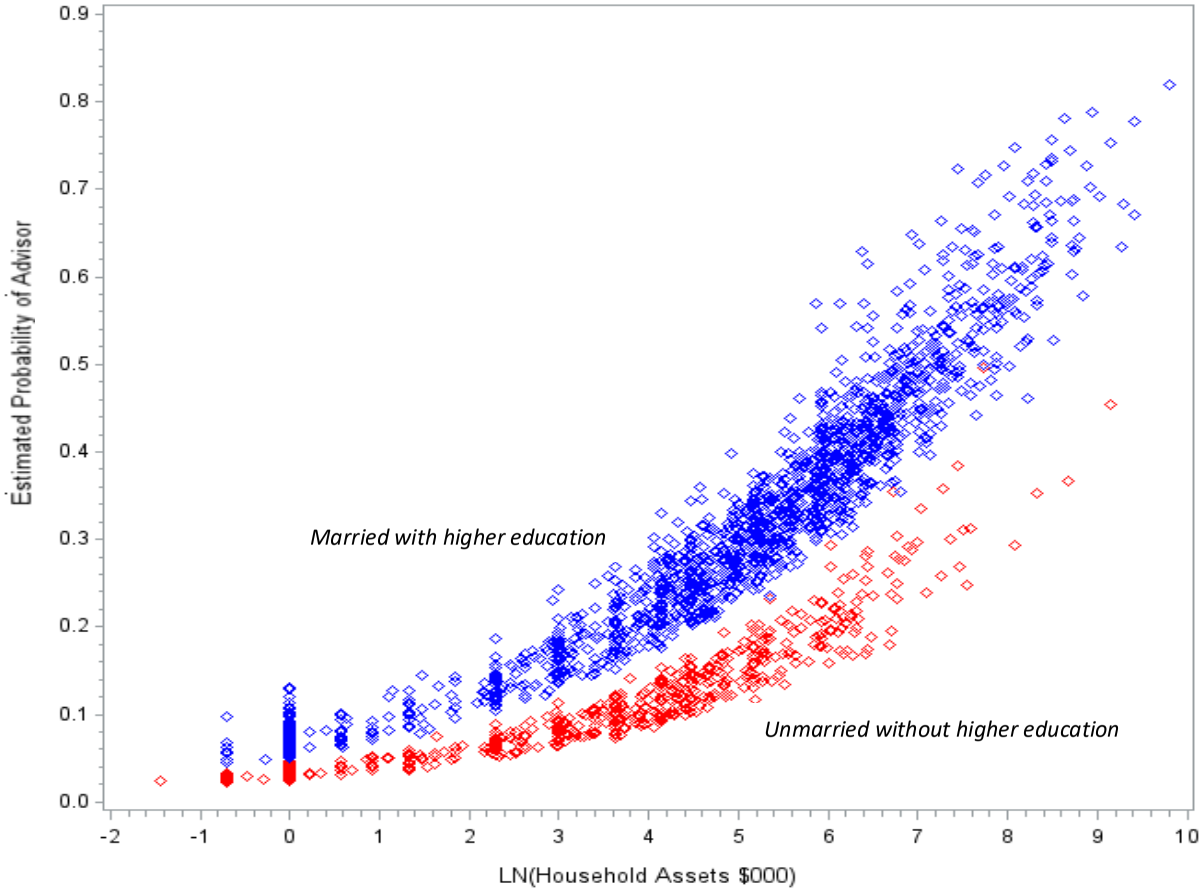

Figure 2

The Relationship Between the Estimated Probability of Using an Advisor and Household Assets

This figure plots the estimated probability of using a financial advisor for surveyed households against total household assets (expressed in logarithmic form). The Estimated Probability of Advisor instrumental variable is generated by the logistic regression summarized by Model 9 in Table 3. The plotted data also indicate whether the household can be classified as being both (i) married, and (ii) having achieved a post-high school education level (blue if "yes" to both conditions, red if "no" to both).